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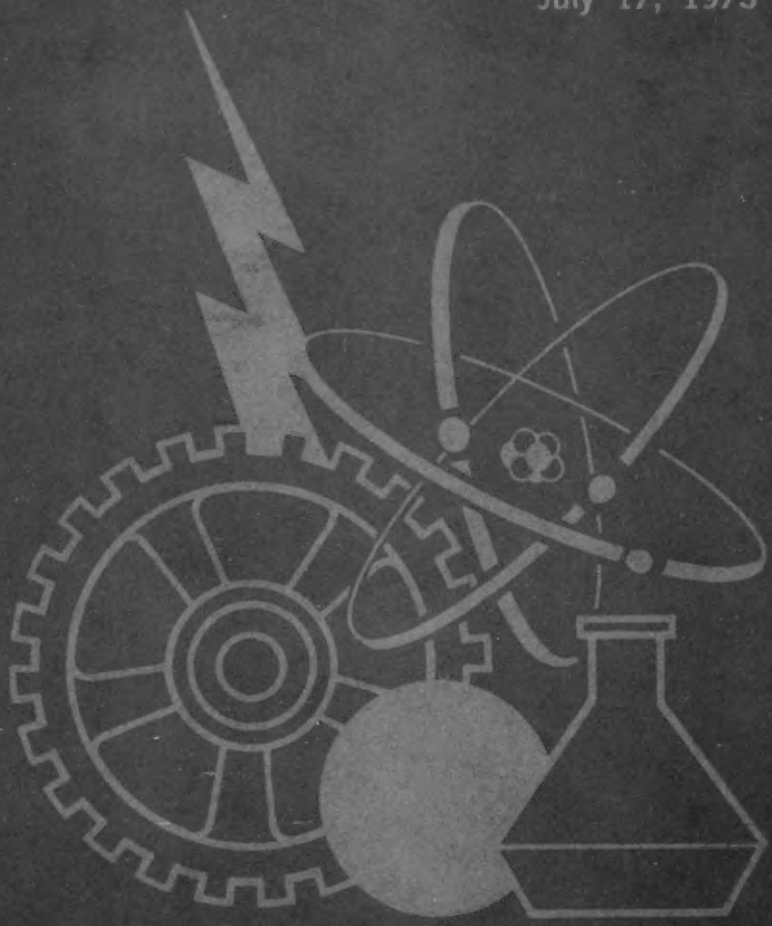
PATENTS

July 17, 1973



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 17, 1973 Volume 912 Number 3

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PATENT NOTICES

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for licensing in accordance with the GSA patent licensing regulations.

Copies of patent applications, either paper copy (PC) or microfiche (MF), can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22151, at the prices cited. Requests for copies of patent applications must include the patent application number and the title. Requests for licensing information should be directed to the address cited with each copy of the patent application.

Paper copies of patents cannot be purchased from NTIS but are available from the Commissioner of Patents, Washington, D.C. 20231, at $0.50 each. Requests for licensing information should be directed to the address cited below for each agency.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. ATOMIC ENERGY COMMISSION

Assistant General Counsel for Patents, Washington, D.C. 20545

Patent 3,702,565. Method for Measuring the Height of Atmospheric Aerosol Air. Filed Sept. 21, 1970. Patented Nov. 14, 1972. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE

Assistant General Counsel for Administration, Washington, D.C. 20230

Patent 3,484,970. Automatic Sheet Turner Using a Rotating Vacuum Head. Filed Mar. 22, 1968. Patented Dec. 23, 1969. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch, Westwood Building, Bethesda, Md. 20014

Patent application 330,675. The Effect of Ascorbate on the Maintenance of 2,3-Diphosphoglycerate (2,3-DPG) in Stored Erythrocytes. Filed Feb. 8, 1973. PC $3/MF $1.45.

Patent application 287,802. High-Resolution Lensless Holographic Microscopy. Filed Sept. 11, 1972. PC $3/MF $1.45.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA, Code GP–2, Washington, D.C. 20546

Patent application 315,068. Wing Upper Surface Flap. Filed Dec. 14, 1972. PC $3/MF $1.45.

Patent application 341,662. Three Axes Controller. Filed Mar. 15, 1973. PC $3.25/MF $1.45.

Patent application 343,308. Flame Detector Operable in Presence of Proton Radiation. Filed Mar. 21, 1973. PC $3.75/MF $1.45.

Patent application 341,621. Reduced Gravity Fecal Collector Seat and Urinal. Filed Mar. 15, 1973. PC $3/MF $1.45.

Patent application 338,484. Decision Feedback Loop for Tracking a Phase Modulated Carrier. Filed Mar. 6, 1973. PC $3.50/MF $1.45.

Patent application 335,201. A System for Stabilizing Cable Phase Delay. Filed Jan. 31, 1973. PC $3/MF $1.45.

Patent application 240,871. Microwave Power Transmission System. Filed Mar. 13, 1973. PC $3/MF $1.45.

Patent application 340,791. A Device for Monitoring a Change in Mass. Filed Mar. 13, 1973. PC $3/MF $1.45.

Patent application 346,483. Journal Bearings. Filed Mar. 30, 1973. PC $3/MF $1.45.

Patent application 346,341. Hollow Rolling Element Bearings. Filed Mar. 30, 1973. PC $3/MF $1.45.

Patent application 280,030. Electrical Resistance Spot Welding and Brazing Techniques for Metal Bonding. Filed Aug. 11, 1972. PC $3/MF $1.45.

Patent application 340,863. Method of Producing I–123. Filed Mar. 13, 1973. PC $3/MF $1.45.

Patent application 344,410. Exhaust Noises in Jet Engines. Filed Mar. 23, 1973. PC $3.25/MF $1.45.

Patent application 340,865. Anti-Meteoroid Device. Filed Mar. 13, 1973. PC $3/MF $1.45.

Patent application 336,319. Solid Medium Thermal Engine. Filed Feb. 27, 1973. PC $3.25/MF $1.45.

Patent 3,715,092. Delayed Simultaneous Release Mechanism. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,715,600. Stacked Solar Cell Arrays. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,715,663. Doppler Compensation by Shifting Transmitted Object Frequency Within Limits. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,715,660. Determining Distance to Lighting Strokes From a Single Station. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,715,723. Frequency Division Multiplex Technique. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,714,645. Rate Data Encoder. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,714,588. Self-Tuning Bandpass Filter. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,715,693. Gyrator Employing Field Effect Transistors. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,714,405. Function Generator for Synthesizing Complex Vibration Mode Patterns. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,718,863. A M-Ary Linear Feedback Shift Register With Binary Logic. Patented Feb. 27, 1973. Not available NTIS.

Patent 3,714,833. Test Stand System for Vacuum Chambers. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,714,624. Display System. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,714,432. Infrared Horizon Locator. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,714,821. Material Fatigue Testing System. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,715,590. Micrometeoroid Analyzer. Patented Feb. 6, 1973. Not available NTIS.

Patent 3,712,132. Droplet Monitoring Probe. Patented Jan. 23, 1973. Not available NTIS.

Patent 3,713,987. Apparatus for Recovering Matter Adhered to a Hoist Surface. Patented Jan. 30, 1973. Not available NTIS.

Patent 3,715,915. Light Intensity Strain Analysis. Patented Feb. 13, 1973. Not available NTIS.

Patent 3,715,152. Multiple Pass Reimaging Optical System. Patented Feb. 6, 1973. Not available NTIS.

[FR Doc. 73–12753; Filed 6–26–73; 8:45 am]

Disclaimers

3,674,993.—*Robert Mienstaedt,* Spartanburg, S.C. CONTROL CIRCUIT ARRANGEMENT FOR CONTROLLING PARAMETERS OF A PROCESS AND A COMPARISON CIRCUIT ARRANGEMENT FOR USE IN CONJUNCTION WITH THE CONTROL CIRCUIT ARRANGEMENTS. Patent dated July 4, 1972. Disclaimer filed June 4, 1973, by the assignee, *Deering Milliken, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to July 16, 1985.

3,694,789.—*William L. Brown,* Minneapolis, Minn. ELECTRICAL RESISTANCE ELEMENT. Patent dated Sept. 26, 1972. Disclaimer filed June 4, 1973, by the assignee, *Rosemount Inc.*

Hereby disclaims the portion of the term of the patent subsequent to May 26, 1987.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,399,538, C. M. Silepcevich and H. T. Hashemi, METHOD FOR SEPARATING RELATIVELY PURE WATER FROM AQUEOUS SOLUTIONS, decided Mar. 28, 1973, Interference No. 97,583, claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13 and 21.

Patent No. 3,440,498, W. B. Mitchell, CONTACTS FOR INSULATION ISOLATED SEMICONDUCTOR INTEGRATED CIRCUITRY, decided Feb. 8, 1973, Interference No. 97,313, claims 1, 2 and 3.

Patent No. 3,454,998, F. B. Satterwhite, YARN TREATING APPARATUS AND METHOD, decided Feb. 14, 1973, Interference No. 97,374, claims 7, 8, 10, 12, 13, 15, 16 and 32.

Patent No. 3,461,003, D. M. Jackson, Jr., METHOD OF FABRICATING A SEMICONDUCTOR STRUCTURE WITH AN ELECTRICALLY ISOLATED REGION OF SEMICONDUCTOR MATERIAL, decided Apr. 13, 1973, Interference No. 97,432, claims 1, 2, 3, 4, 5 and 6.

Patent No. 3,468,385, S. J. Penza, UNDERWATER POWER TOOL, decided Dec. 29, 1972, Interference No. 97,400, claims 1, 2, 3, 4 and 5.

Patent No. 3,487,678, A. R. Thomson and J. W. Eveleigh, SAMPLE LOADING APPARATUS, decided Feb. 16, 1973, Interference No. 97,383, claims 1, 2 and 14.

Patent No. 3,494,969, G. J. Kallos, PREPARATION OF STYRENES, decided Apr. 10, 1973, Interference No. 97,784, claim 1.

Patent No. 3,499,910, P. R. Driscoll, MONOHALOPHENYL-THIAZOLYL UREAS, decided Apr. 9, 1973, Interference No. 98,098, claim 1.

Patent No. 3,511,872, M. H. Sherlock, GLYCERYL-N-(SUBSTITUTED PHENYL) ANTHRANILATES, decided Apr. 13, 1973, Interference No. 97,843, claim 1.

Patent No. 3,544,486, E. M. Passmore, REFRACTORY BODIES CONTAINING ALUMINUM NITRIDE, BORON NITRIDE AND TITANIUM BORIDE, decided Feb. 9, 1973, Interference No. 97,668, claims 1, 3 and 7.

Patent No. 3,555,574, D. A. Stanwood, SPRING LOADED WEIR FOR POOL SKIMMERS, decided May 9, 1973, Interference No. 97,814, claims 1, 2, 3, 4 and 5.

Patents Available for Licensing or Sale

2,970,783. COMPOSITE WEARING PARTS FOR CRUSHERS AND THE LIKE. A. H. Plyer, 55 E. Monroe, Chicago, Ill., 60603.

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court East, Syosset, N.Y., 11791.

3,474,799. TOOTH SPACE DENTAL FLOSS HOLDER CLEANER. Vito P. Capello, 1047 Franklin St., Santa Monica, Calif., 90403.

3,614,968. APPARATUS FOR SLICING LUMBER. John R. Hirz, 1233 S. Boyden, Mount Collins, Colo., 80521.

3,636,938. PORTABLE COOKING GRILL. Edward J. Faltersack, 19517 Almaden Road, San Jose, Calif., 95120.

3,661,166. FLUID LOGIC CONTROL SYSTEM. R. W. Watson, Garlock, Inc., Division St., Palmyra, N.Y., 14522.

3,709,686. METHOD FOR PRODUCING SELECTED COLOR PHOTOGRAPHS. John B. Erdell, 365 Clinton Ave., Brooklyn, N.Y., 11238.

3,733,936. MASTER RATCHET WITH QUICK ACTION DUAL DRIVE. Wilford Flynn, R.R. 6, Bedford, Ind.

3,733,985. CAMERA FILM IMAGING DEVICE. Lester Gordon, 10 Louise St., Lewiston, Maine.

2,738,000. DISPOSABLE RAZOR. Alexander Samko, 1647 Rodman St., Hollywood, Fla., 33020.

The following 2 patents are offered by: Sigmund P. Rose, 37—27 72nd St., Jackson Heights, N.Y., 11372.

3,376,000. DIRECTIONALLY STABLE PARACHUTE.

3,545,704. PARACHUTE OPENING DEVICE.

Rockwell International Corporation is prepared to grant non-exclusive licenses under the following 2 patents upon reasonable terms.

Application for license may be addressed to Rockwell International Corporation, Los Angeles Aircraft Division, International Airport, Los Angeles, Calif., 90009, Attn.: Division Patent Counsel.

3,444,608. ROLL DIFFUSION BONDING METHOD.

3,550,252. ROLL DIFFUSION BONDING METHOD.

RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 37 patents.

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of Americas, New York, N.Y., 10036.

3,730,606. METHOD FOR FABRICATING A GAS LASER TUBE.

3,730,719. METHOD AND ARTICLE FOR COLOR KINESCOPE SCREEN AND MASK PRODUCTION.

3,730,969. ELECTRONIC DEVICE PACKAGE.

3,730,991. GROUNDED FACEPLATE KINESCOPE SYSTEM.

3,731,114. TWO PHASE LOGIC CIRCUIT.

3,731,160. MICROWAVE SEMICONDUCTOR DEVICE ASSEMBLY.

3,731,180. FREQUENCY TRANSLATOR CIRCUIT.

3,731,317. VIBRATING WEB TRANSPORT APPARATUS.

3,731,861. METHOD FOR DICING MATERIALS HAVING A HEXAGONAL CRYSTAL STRUCTURE.

3,732,358. AUTOMATIC CHROMA CONTROL CIRCUITS.

3,733,258. SPUTTER-ETCHING TECHNIQUE FOR RECORDING HOLOGRAMS OR OTHER FINE-DETAIL RELIEF PATTERNS IN HARD DURABLE MATERIALS.

3,733,430. CHANNEL MONITORING SYSTEM.

3,733,559. DIFFERENTIAL AMPLIFIER.

3,734,847. ELECTROPHORETIC DEPOSITION OF POWDERED MATERIAL ON AN INSULATING SUPPORT.

3,735,028. TELEVISION CAMERA SYSTEM WITH A SINUSOIDALLY VARYING INDEXING SIGNAL.

3,735,033. TELEVISION CAMERA SYSTEM WITH ENHANCED FREQUENCY RESPONSE.

3,735,038. MEANS FOR SUPERIMPOSING A MARKER SIGNAL ONTO A COMPOSITE VIDEO SIGNAL.

3,735,191. DYNAMIC CONVERGENCE CIRCUITS.

3,735,192. VERTICAL DEFLECTION CIRCUITS UTILIZING BOTH REGENERATIVE AND DEGENERATIVE FEEDBACK FOR GENERATING PARABOLIC VOLTAGES.

3,735,208. THERMAL FATIGUE LEAD-SOLDERED SEMICONDUCTOR DEVICE.

3,735,210. ZENER DIODE FOR MONOLITHIC INTEGRATED CIRCUITS.

3,735,267. BALANCED MIXER.

3,735,299. COLOR TELEVISION DEFLECTION YOKE HAVING REDUCED VARIATION IN BEAM TRIO DISTORTION.

3,735,335. ELECTRONIC FENCE VEHICLE LOCATOR TRANSMITTER AND SYSTEM USING SAME.

3,735,413. MULTIFREQUENCY ANTENNA SYSTEM INCLUDING AN ISOLATION SECTION OPEN CIRCUITED AT BOTH ENDS.

3,735,482. METHOD OF MAKING AN MOS TRANSISTOR INCLUDING A GATE INSULATOR LAYER OF ALUMINUM OXIDE AND THE ARTICLE SO PRODUCED.

3,735,976. DOCUMENT PICKER.

3,736,158. CZOCHRALSKI-GROWN SPINEL FOR USE AS EPITAXIAL SILICON SUBSTRATE.

3,736,378. VIDEO SIGNAL PROCESSING STAGE WHICH PERFORMS PLURAL FUNCTIONS.

3,736,406. THERMOGRAPHIC PRINT HEAD AND METHOD OF MAKING SAME.

3,736,412. CONVERSION OF BASE B NUMBER TO BASE R NUMBER, WHERE R IS A VARIABLE.

3,736,469. SWITCHING REGULATOR OVERLOAD PROTECTION CIRCUIT.

3,736,478. RADIO FREQUENCY TRANSISTOR EMPLOYING HIGH AND LOW-CONDUCTIVITY BASE GRIDS.

3,736,496. ENERGY PUMP VOLTAGE REGULATOR.

3,736,518. MASER INCORPORATING CRYSTAL HAVING F-CENTERS.

3,736,525. UNITIZED INTERNALLY-MODULATED GAS LASER.

3,736,533. APPARATUS FOR EFFICIENTLY CONVERTING ACOUSTIC ENERGY INTO ELECTRICAL ENERGY.

General Electric Company is prepared to grant non-exclusive licenses under the following 31 patents upon reasonable terms to domestic manufacturers.

Applications for licenses under the following patent may be addressed to the: Patent Counsel, Mobile Radio Department, General Electric Co., Lynchburg, Va., 24502.

3,727,034. COUNTING SYSTEM FOR A PLURALITY OF LOCATIONS.

Applications for license under the following 3 patents may be addressed to: Division Patent Counsel, Switchgear Equipment Business Div., General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,723,816. CURRENT LIMITING STATIC SWITCH.

3,725,742. STATIC CIRCUIT BREAKER.

3,729,652. SOLID STATE SURGE SUPPRESSOR.

Applications for license under the following 5 patents may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,429,140. HOUSEHOLD REFRIGERATOR INCLUDING ICE AND WATER DISPENSING MEANS.

3,525,232. AUTOMATIC ICE MAKER CONTROL MEANS.

3,561,231. COMBINATION REFRIGERATOR WITH ICE SERVICE IN FRESH COMPARTMENT DOOR.

3,717,010. AIR CONDITIONER.

3,720,073. AIR CONDITIONER.

Applications for license under the following 22 patents may be addressed to the: Patent Counsel, Home Entertainment Business Division, General Electric Company, Bldg. 1, Rm. 104, Electronics Park, Syracuse, N.Y., 13201.

2,830,274. ELECTROMECHANICAL TRANSDUCER.

2,906,919. DEFLECTION CIRCUIT.

2,974,296. ELECTROMECHANICAL TRANSDUCER.

2,975,354. ELECTRICAL CONVERSION APPARATUS.

3,176,212. DIRECT CURRENT POWER SUPPLIES.

3,188,872. FINE-COARSE TUNING DRIVE UTILIZING BALL BEARING TYPE GEARING TO COUPLE SHAFT.

3,426,604. DIFFERENTIAL SPEED ROTARY DRIVE ASSEMBLY.

3,435,139. CONTRAST CONTROL CIRCUIT FOR TELEVISION RECEIVER.

3,617,077. IMPROVED KNOB MEANS FOR ELECTRONIC DEVICE SLIDEABLE CONTROL.

3,629,789. TV RECEIVER SAFETY INTERLOCK SYSTEM FOR POWER CONNECTIONS.

3,644,986. METHOD OF TUNING HIGH VOLTAGE TRANSFORMER FOR TV RECEIVER.

3,646,253. IMPROVED TINT CONTROL FOR COLOR TV RECEIVER.

3,654,510. DIRECT DRIVE VERTICAL DEFLECTION SYSTEM.

3,671,869. A TV CHANNEL INDICATOR COMMON TO VHF AND UHF AND EASILY PROGRAMMABLE TO LOCALLY AVAILABLE CHANNELS.

3,673,319. VIDEO COMPENSATION CIRCUIT FOR EMPHASIZED CARRIER DETECTOR.

3,674,919. DISABLING CIRCUITRY FOR AUTOMATIC FREQUENCY HUE CONTROL.

3,676,582. EMPHASIZED CARRIER CIRCUIT WITH INTEGRAL AFC OPERATION.

3,686,517. TEMPERATURE COMPENSATION MEANS FOR ELECTRONIC CIRCUIT.

3,699,580. ANTENNA MOUNTING CLIP.

3,711,635. MEANS AND METHOD FOR MODIFYING THE FLESH TONE RESPONSE OF A COLOR TV RECEIVER.

3,715,467. TINT CONTROL FOR COLOR TV RECEIVERS.

3,715,479. TINT CONTROL CIRCUIT USING PHASE SPLITTER.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 23, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-30-72
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-01-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-03-72
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-24-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-24-72
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-15-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-16-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning: Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-23-72
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-13-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	7-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-02-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-12-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-24-72

Expiration of patents: The patents within the range of numbers indicated below expire during July 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,762,595 to 2,787,377, inclusive
Plant Patents..... Numbers 1,492 to 1,504, inclusive

REISSUES

JULY 17, 1973

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,696

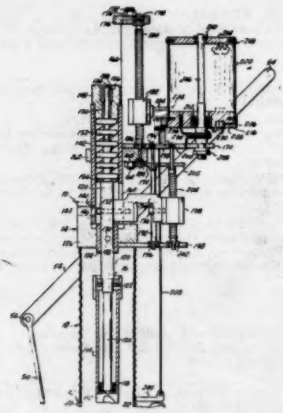
SOIL PENETRATION AND SHEAR MEASURING INSTRUMENT

Edward M. Hawes, 32418 Birkshire Road, St. Clair Shores, Mich. 48082

Original No. 3,552,194, dated Jan. 5, 1971, Ser. No. 744,359, July 12, 1968. Application for reissue Mar. 31, 1971, Ser. No. 129,707

Int. Cl. F16h *29/20;* G01n *3/14, 3/24*

U.S. Cl. 73—84 9 Claims



In this instrument a sinkage plate attached to a vertical shaft is selectively pushed straight downward for straight penetration or in a spiral path for shear penetration by means of a rotary nut threadedly engaging a rotary fast-thread screw shaft which is selectively connected or disconnected from the nut for unitary or relative motion therebetween by means of a selective clutch. The screw shaft at its upper end is engaged by the lower end of a non-rotatable shaft through a thrust bearing. The non-rotatable shaft is in turn engaged by and subjected to the thrust of a calibrated compression loading spring, the upper end of which is given an initial loading by manually moving downward an upper spring abutment structure carrying a rotary recording drum. The downward motion of the non-rotatable shaft is transmitted through a carriage and motion-multiplying mechanism to a scriber which records the motion on a chart attached to the rotary drum. The resulting graph shows the resistance offered by the ground to the penetration of the sinkage plate either direct or in shear, depending on whether the screw shaft is locked by a clutch against rotation or is unlocked and free to rotate. The recording drum is spring-wound and its rotation is controlled by a flexible cable wound around a portion of the drum and guided downward over a pulley to an anchorage on the substantially immovable base structure of the instrument.

27,697

SOLS OF ACTINIDE METAL OXIDES

Wayne T. Barrett, Malvern, Pa., and Moises G. Sanchez and Milton C. Vanik, Severna Park, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Original No. 3,164,554, dated Jan. 5, 1965, Ser. No. 25,847, May 2, 1960. Application for reissue Jan. 5, 1967, Ser. No. 613,060

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 S 6 Claims

The invention is to a method of preparing a metal oxide clad sol of a hydrous oxide of thoria, urania, plutonia, or mixtures thereof, by adding a monobasic acid salt of zirconium or titanium to an aqueous dispersion of said hydrous oxide and then concentrating the solution and passing it through an ion exchange membrane and recovering the metal oxide clad sol.

27,698

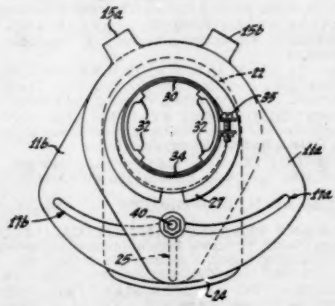
GANGED RING MAGNETS FOR COORDINATED CONTROL OF A PLURALITY OF BEAMS

Joseph Le Roy Werst, Lancaster, Pa., assignor to RCA Corporation

Original No. 3,305,744, dated Feb. 21, 1967, Ser. No. 439,602, Mar. 15, 1965. Application for reissue July 15, 1968, Ser. No. 747,030

Int. Cl. H01f *1/00*

U.S. Cl. 335—212 8 Claims



A magnetic correction device for use with cathode ray tubes having a facility for effecting lateral beam correction with multi-pole magnet rings. Mounting structures are associated with the magnet rings in such a manner as to insure that rotation of one magnet ring will be accompanied by an equal and opposite rotation of the other magnet ring; the associated structure also limits the rotation of each magnet to an appropriate arcuate distance. The mounting structure further serves to establish the positions of the magnet poles relative to the beam positions such that vertical components of beam motion are minimized.

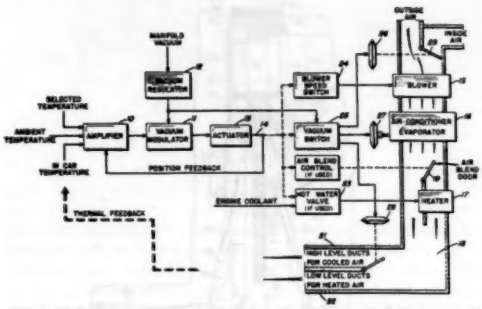
27,699
CONTROL SYSTEM FOR AUTOMOBILE AIR CONDITIONERS

Richard S. Weaver, Timonium, and John M. Miller and Michael Slavin, Towson, Md., assignors to The Bendix Corporation

Original No. 3,315,730, dated Apr. 25, 1967, Ser. No. 420,061, Dec. 21, 1964. Application for reissue Aug. 9, 1971, Ser. No. 170,159

Int. Cl. B60h *3/00*

U.S. Cl. 165—23 **11 Claims**



An automatic control system for controlling the cooling or heating output of an automobile air conditioner which combines in various proportions cooled air from an engine driven mechanical refrigeration system with warm air from a heater through which engine coolant is circulated, to achieve a controllable air temperature. An actuator powered by engine manifold vacuum controls the speed of a blower and positions a blend door which diverts portions of cooled air through the heater, the discharge air being formed by the mix of undiverted cooled air with heated air. Electrical signals representing selected, ambient and in-car temperatures are combined with an electrical signal representing the output position of the actuator in an amplifier, the output of which controls a transducer modulating the vacuum applied to the actuator, thereby providing closed loop automatic control of the automobile interior air temperature.

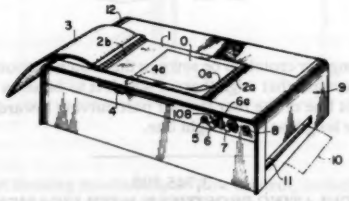
27,700
ELECTROPHOTOGRAPHIC DUPLICATOR

Shigeru Suzuki, Keiji Sugita, Yutaka Koizumi, and Tadaaki Kanno, Yokohama, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Original No. 3,533,691, dated Oct. 13, 1970, Ser. No. 672,252, Oct. 2, 1967. Application for reissue July 13, 1971, Ser. No. 162,318

Int. Cl. C03g *15/00*

U.S. Cl. 355—13 **3 Claims**



An electrophotographic duplicator having a roll of copy paper at one end mounted in a light-impervious chamber. The copy paper is freely removed from the roll and passed into a suction chamber and fed by belts across a surface which faces a transparent supporting surface for an original to be duplicated. A continuously slidable indicator extends along the supporting table and is coupled with a cutting device and a device for feeding paper such that a given length of paper corresponding to the setting of the indicator will be fed to the belts. The adjustment of the indicator is continuous and the indicator is set to the position of the leading edge of the original to be duplicated. *The setting of the indicator governs the travel of a movable optical system between a stationary original and a stationary copy sheet and determines the operation of a cutter to sever the copy from the roll in accordance with the length of the original.*

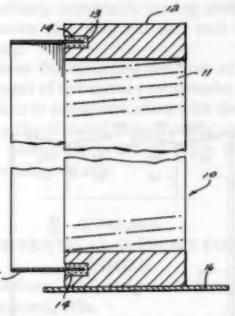
27,701
FILTER FRAME SEAL

Adrian R. Allan, Jr., Washington, D.C., and Martin R. Fink, Remsenburg, N.Y., assignors to Flanders Filters, Inc., Riverhead, N.Y.

Original No. 3,529,406, dated Sept. 22, 1970, Ser. No. 751,616, Aug. 9, 1968. Application for reissue Apr. 17, 1972, Ser. No. 244,970

Int. Cl. B01d *45/10*

U.S. Cl. 55—500 **2 Claims**



An air filter having a channel about its front periphery which is filled with a fluid of relatively high consistency. The channel is adapted to receive a mating retainer when the filter is positioned in its supporting housing, whereby the retainer is frictionally and sealably engaged by the fluid in the filter channel.

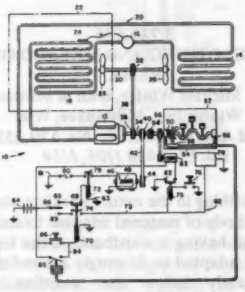
27,702
DUAL POWERED REFRIGERATION SYSTEM

David J. Petranek, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Original No. 3,545,222, dated Dec. 8, 1970, Ser. No. 767,260, Oct. 14, 1968. Application for reissue May 10, 1971, Ser. No. 141,510

Int. Cl. F25b *27/00*

U.S. Cl. 62—236 **11 Claims**



A refrigeration system of the vapor compression type alternatively driven by an engine or an electric standby motor in which means is provided to prevent the standby motor from driving the refrigeration compressor and fans until after the engine has been drivingly disengaged from the compressor and fans.

PATENTS

GRANTED JULY 17, 1973

GENERAL AND MECHANICAL

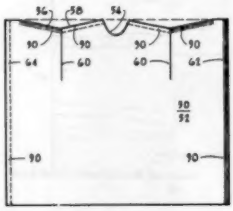
3,745,587
DISPOSABLE HOSPITAL PATIENTS GOWN WITH COHESIVE-ADHESIVE APPLIED SO THE AREAS OF APPLICATION HAVE SPACE THEREIN FREE OF COHESIVE-ADHESIVE

Theodore Bradley, 147 Eldorado St., Monterey, Calif.

Continuation-in-part of Ser. No. 828,407, March 12, 1969, which is a continuation-in-part of Ser. No. 534,903, March 16, 1966, Pat. No. 3,451,062, which is a continuation-in-part of Ser. No. 584,322, Sept. 27, 1966, Pat. No. 3,399,406. This application Jan. 18, 1971, Ser. No. 107,289

Int. Cl. A41b *9/00*

U.S. Cl. 2—114 **25 Claims**



A disposable hospital patient's gown made from a sheet of disposable material with a medial neck opening, and arm openings with a cohesive-adhesive applied to confronting surfaces of the sheet at the top edge intermediate said arm openings and said neck opening, and intermediate said arm openings and said side edges, and applied along the confronting surface areas of the side edges so the areas of application have spaces therein without cohesive-adhesive as a means for attaching, separating and reattaching the top edge of the sheet and the sides of the sheet about the patient's body.

3,745,588
ARTICLE OF CLOTHING AND METHOD OF MAKING SAME

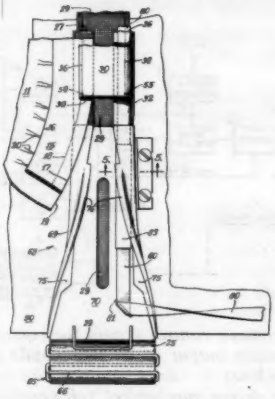
Frank Pehle, and Michael Winter, both of Milwaukee, Wis., assignors to Jack Winter Inc., Milwaukee, Wis.

Filed Aug. 9, 1971, Ser. No. 170,235

Int. Cl. A41d *1/06, 1/14*

U.S. Cl. 2—221 **16 Claims**

An article of clothing in the nature of skirts, slacks, or shorts including a main body of material adapted to encircle the hips of the wearer and having a waistband at the top of the main body of material adapted to fit snugly around the hips of the wearer immediately below the waistline wherein the waistband comprises an elongate band of outerwear material having upper and lower edges folded inwardly to form hems embracing a band of relatively heavy stiffener material, a row of stitching securing each hem edge, and a strip of elastic material stitched into the upper hem in stretched condition, so that when the elastic material is relaxed, it contracts the upper edge of the waistband to form a generally conical shape adapted to fit the similar shape of the hips adjacent the waistline. The method of and the apparatus for making the



waistband and simultaneously attaching it to the main body of material are also disclosed.

3,745,589
TRIANGULAR CROTCHES FOR TROUSERS

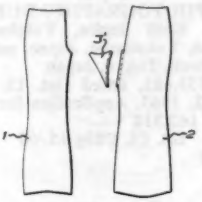
Ebbe Bruno Borsing, Skivarp, Sweden, assignor to Borsing Modeller AB, Malmo, Sweden

Filed May 13, 1971, Ser. No. 143,013

Claims priority, application Sweden, June 1, 1970, 7516/70

Int. Cl. A41d *1/06*

U.S. Cl. 2—227 **2 Claims**



A triangular crotch to be sewn to the crotch section of a pair of trousers has that edge thereof which is to be sewn on along a straight line of the rear trouser part curving inwardly and of the same length as the straight line.

3,745,590
ARTICULATING PROSTHESIS WITH LIGAMENTOUS ATTACHMENT

James A. Stubstad, Lafayette, Calif., assignor to Cutter Laboratories, Inc., Berkley, Calif.

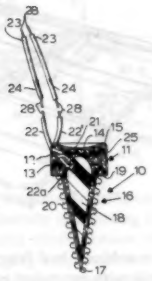
Filed June 25, 1971, Ser. No. 156,664

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 **19 Claims**

A prosthesis useful in the repair or replacement of damaged or diseased joints in the human body, in particular of those which require unrestricted orbiting motion such as the base of

the thumb, carpal bones of the wrist, shoulder joints and the like. A molded body portion replaces at least the articulating portion of the bone to be treated and one or more ligamentous elements. The body portion is suitably made of a biocompatible elastomer, especially one which is reinforced with a fibrous material such as a web or mesh of Dacron or Teflon. The ligamentous element can be a cord, flat tape or a tube



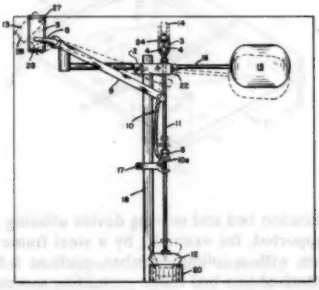
such as a fabric tube of Dacron or Teflon, and in some embodiments is protected against tissue ingrowth over at least its intermediate length. In a carpal-metacarpal prosthesis for a thumb, for example, the body portion also has a metacarpal stem portion having a tissue-ingrowth-receiving surface, such as a complete or partial covering of Dacron velour, the core of such stem being suitably a biocompatible elastomer.

3,745,591

TOILET FLUSHING MECHANISM

William Girten, 805 S. W. 20th St., Fort Lauderdale, Fla.

Filed May 5, 1971, Ser. No. 140,495
Int. Cl. A47k *17/00*
U.S. Cl. 4—1 **5 Claims**



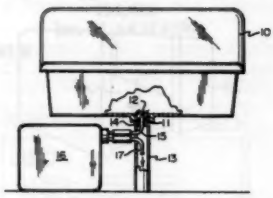
A toilet flushing mechanism or flow control, including a lift rod carrying a bulb valve, a hand lever disposed on the outside of the water tank with linkage connecting the hand lever to the lift rod. Means is provided for restricting hand lever movement when desired to secure a limited water outflow, such means being shiftable to then secure full outflow. A balanced lever is provided to engage under stops on the lift rod to hold the same elevated. And said lever is tripped by the rod that carried a ball float, allowing the lift rod and its bulb valve to close and shut off the water flow.

3,745,592

DEVICE FOR THE COLLECTION OF URINE

Leo J. Novak, 2941 S. Dayton Lakeview Rd., New Carlisle, Ohio

Filed Jan. 17, 1972, Ser. No. 218,490
Int. Cl. E03d *13/00*
U.S. Cl. 4—99 **4 Claims**



This invention relates to a device for the collection of urine for use with a urinary receptacle having drainage means for conveying the urine to a disposal site, said urine collection device comprising:

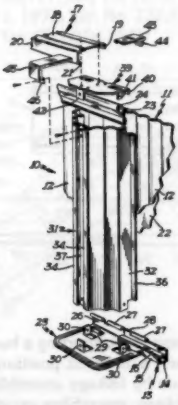
a. stopper means for diverting the flow of urine from the drainage means of the urinary receptacle;
b. storage means in communication with the stopper means for receiving the diverted flow of urine; and
c. means for conveying overflow urine from the storage means to the disposal site.

3,745,593

MULTI-PIECE VERTICAL SUPPORT FOR SWIMMING POOLS

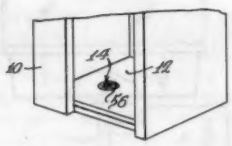
Arvel L. Wall, Helena, Ark., assignor to Doughboy Industries, Inc., New Richmond, Wis.

Continuation of Ser. No. 868,505, Oct. 22, 1969. This application Sept. 23, 1971, Ser. No. 188,674
Int. Cl. E04h *3/16, 3/18;* E02d *27/00*
U.S. Cl. 4—172.19 **4 Claims**



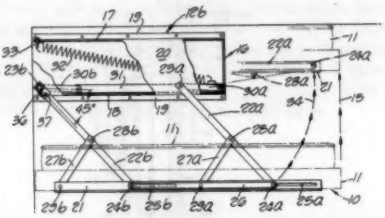
A multi-piece vertical support for an above-ground swimming pool includes a flat base plate which is secured to the bottom rails of the swimming pool. A pair of vertical side plates are releasably secured together by interlocking elements on a central plate and the side plates. In another embodiment, two pairs of side plates are provided, and in further embodiment, the flanges or side plates are releasably secured together by a locking element. Each vertical support includes a cap and attachment elements which attach each support to the upper rails.

3,745,594
SHOWER FLOOR DRAIN
John A. Cosper, Birmingham, Ala., assignor to Cosper Manufacturing Company, Inc., Birmingham, Ala.
Filed June 16, 1971, Ser. No. 153,730
Int. Cl. E03c 1/26
U.S. Cl. 4—292 7 Claims



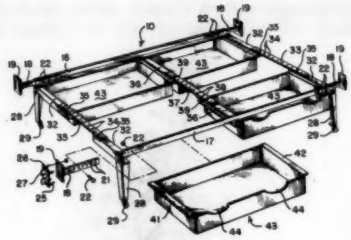
The shower floor drain has a main casting of iron which includes a downwardly projecting portion adapted to be connected to the drainpipe. An outwardly and slightly upwardly extending flange is integral with the upper end of the tubular portion and has an upward lip formed on its circular outer periphery. There are a pair of upwardly facing, diametrically opposite and tapped bosses on said flange within the lip. A decorative rim made of stainless steel or the like is pressed on and encloses the lip and has a narrow horizontal flange below its upper limit and spaced slightly above the upper faces of the bosses. A stainless steel strainer overlies the rim flange, is of less diameter than the inner diameter of the lip, and is screwed to the bosses to anchor the rim to the casting and to insure that the exposed surfaces of the drain are corrosive resistant.

3,745,595
SUSPENSION MEANS FOR BUNK BEDS
Emery J. Nagy, Burbank, Calif., assignor to Kwikee Enterprises Inc. Drain, Oreg.
Filed Aug. 29, 1972, Ser. No. 284,644
Int. Cl. A47c 17/40
U.S. Cl. 5—9 R 10 Claims



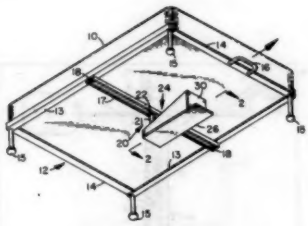
Suspension means for supporting a bunk bed for translatory movement between a lowered position of use and a raised position on non-use by linkage assemblies respectively at the bed ends, the linkage assemblies providing parallel motion operations so that in one form of the invention the bed remains horizontal and is not tilted, while in another form, through the use of lost motion connections the bed in raised position may be further moved from the usual horizontal raised position to a tilted position to conform with a sloping ceiling. Provision is also made in one embodiment of the invention to shift the bed forwardly and rearwardly in response to the translatory movement so that the path of movement of the bed will be substantially vertical rather than curved. The linkage assemblies are synchronized, and coordinated in their movements by a unique adjustable torsion member.

3,745,596
COMBINED BED FRAME WITH STORAGE COMPARTMENT
Marihelen M. Copeland, 2742 Milner Ct., Birmingham, Ala.
Filed May 7, 1971, Ser. No. 141,274
Int. Cl. A47c 19/22
U.S. Cl. 5—308 2 Claims



A bed frame or combined bed frame for storage compartment having side rails with extension end bars for adapting the bed frame to different length and width beds and provided with attaching plates to secure any head and foot boards thereto, for use without end boards, legs are provided in the same end assembly with caster wheels for support of the bed frame independently of any head or foot boards. Lateral supports including projections adjustably opposing one another from the corresponding ends of the side rails and entering into the end assemblies to provide a rigid construction. Extension members adjustably interconnecting the projections forming the drawer guides for the storage drawers to provide the full lateral supports for the bed frame.

3,745,597
BED MOVING DEVICE
Kenneth J. Kurtz, 3151 Harbor Blvd., Costa Mesa, Calif.
Filed Nov. 26, 1971, Ser. No. 202,231
Int. Cl. A47c 19/22
U.S. Cl. 5—328 12 Claims



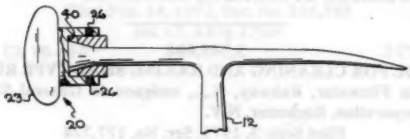
A combination bed and moving device utilizing an inclined surface supported, for example, by a steel frame or box, in combination with a rolling member, such as a ball castor, which is attached to a bed frame permitting movement of the rolling member on the inclined surface. The bed frame is moved up the inclined surface to a retention area where means are provided such as a depression or level area to retain the rolling member at the desired retention area. At the elevated retention area the bed frame can be easily rotated and moved about the axis of the attachment between the rolling member and the frame. A handle on the bed frame provides an easy means for respectively pushing and pulling the bed frame and attached rolling member up and down the inclined surface. The invention is particularly useful for raising and moving beds for purposes of cleaning under them, and also the rotation thereof to provide ease in changing the sheets.

3,745,598

CARPET INSTALLATION TOOL

Leonard C. Krell, 5847 Secor Rd., Toledo, Ohio

Filed Dec. 30, 1970, Ser. No. 102,793
Int. Cl. B25f 1/02
U.S. Cl. 7—8 **4 Claims**



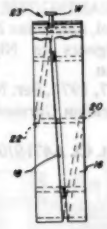
A device adapted for removable securement to a carpet installer's tack hammer, thereby converting the tack hammer by reason of the contour and configuration of the device into a tool having utility in urging carpets in a desired manner; the device comprising one end segment capable of being releasably secured to the tack hammer and, integral therewith, a curved blade-like projection adapted for contact with the carpet in the region desirably manipulated or urged in a particular manner or direction.

3,745,599

METHOD AND APPARATUS FOR THE ASSEMBLY OF SCREW BLANKS AND WASHERS

Kenneth D. Ringland, Keene, N.H., assignor to Central Screw Company, Broadview, Ill.

Filed July 28, 1971, Ser. No. 166,834
Int. Cl. B23p 19/08; B21k 27/00
U.S. Cl. 10—155 A **3 Claims**



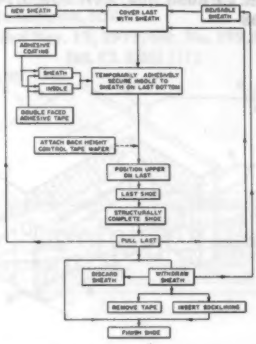
A method and apparatus for the assembly of washers or other apertured members onto the shank ends of screw blanks, screws or the like wherein the washers and screw blanks are fed to an assembly station where the washers are introduced to the screw blanks with the washers oriented with the planes thereof at an angle to the shank ends of the screw blanks, the shank ends of the screw blanks being moved into the apertures in the washers to pick up the washers in a continuous motion through the assembly station. One form of transfer device for the screw blanks includes a rotatable disc-shaped dial having transverse T-shaped slots for receiving the heads of screw blanks, the dial being rotatable within a stationary sleeve which has a helical cam slot for receiving the shank ends of the screw blanks so that the helical slot cams the screw blanks transversely of the dial as the dial rotates within the sleeve.

3,745,600

METHOD OF MAKING SHOES OVER SHEATHED LAST UTILIZING A LASTING ELEMENT

Jerome A. Rubico, 196 Trenton St., Boston, and Charles F. Batchelder, 75 Canton Ave., Milton, both of Mass.

Division of Ser. No. 66,212, Aug. 24, 1970, which is a continuation-in-part of Ser. No. 805,205, May 7, 1969, Pat. No. 3,525,110. This application Oct. 21, 1971, Ser. No. 191,416
Int. Cl. A43d 9/00
U.S. Cl. 12—142 R **11 Claims**



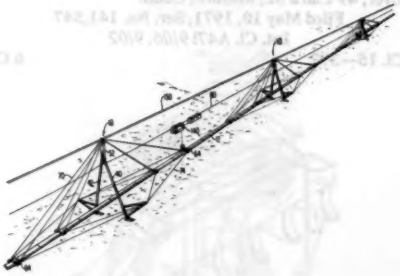
A method for making shoes over a sheathed last using a lasting element. In one embodiment of the invention, the lasting element comprises a single layer of a very thin and relatively flexible material while in another embodiment, the lasting element comprises a laminated structure.

3,745,601

AERIAL PIPELINE SYSTEM

Weldon F. Appelt, 2102 Quenby, Houston, Tex.

Division of Ser. No. 53,717, July 10, 1970. This application Feb. 11, 1972, Ser. No. 225,523
Int. Cl. E01d 19/02
U.S. Cl. 14—77 **2 Claims**



The aerial pipeline system provides for suspending large diameter pipe between a plurality of spaced towers across every conceivable type of terrain and in all climates. Each of the towers are of approximate A-frame configuration with an aerial tramway cable suspended between each tower through the opening between the legs of the tower for the purpose of transporting the pipe and other supplies during construction of the pipeline and for transporting inspection and maintenance personnel and supplies subsequent to construction. The pipeline will be suspended from the towers and extend through the opening between the legs. Depending upon the loading, the pipeline may be arranged for either vertical or horizontal expansion and contraction. A multiple section,

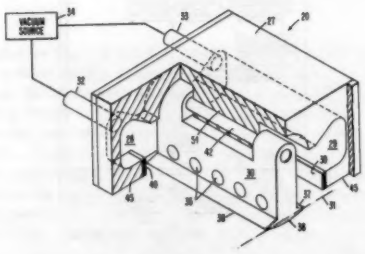
hinged trolley beam is also disclosed for supporting and transporting long sections of pipe along the cable which is suspended in a sagging manner between adjacent towers. A smaller manually portable cable tramway is also provided for bringing in supplies for the construction of the pipeline.

3,745,602

WEB CLEANING APPARATUS HAVING A MOVABLE BLADE

Rex G. Beistle, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1972, Ser. No. 226,162
Int. Cl. B08b 5/04; A47l 5/38, 5/14
U.S. Cl. 15—308 **17 Claims**



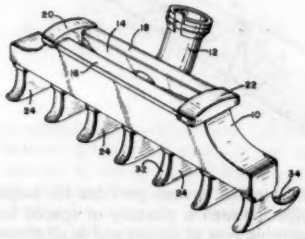
A magnetic tape unit having a movable-blade tape cleaner forming part of the tape processing station. The movable blade extends into the tape path and is bidirectionally movable, as a result of tape movement. Two operate blade positions are determined by two stops. In each of the operate positions a cleaning edge is presented to the moving tape. The direction of movement of the movable blade to an operative position is controlled by the direction of tape movement.

3,745,603

VACUUM CLEANER SUCTION TOOL FOR CLEANING DEEP PILE SHAG RUGS

Frank K. Bayless, 9 Garden City Rd., Darien, Conn.; Horace W. Brundage, 277 Loveland Rd., Stamford, Conn.; Robert A. Evans, 86 Mitchell St., Stamford, Conn., and John W. Hoover, 49 Clark St., Milford, Conn.

Filed May 10, 1971, Ser. No. 141,547
Int. Cl. A47l 9/06, 9/02
U.S. Cl. 15—397 **6 Claims**



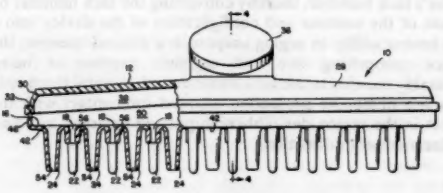
In accordance with the present invention there is provided a suction tool having a plurality of spaced narrow, hollow nozzles depending from the body of the tool and elongated in a horizontal direction parallel to the normal forward and backward horizontal movement of the tool. The lower surfaces or lips of these nozzles are curved upwardly at their opposite ends and the interior surfaces of the nozzles adjacent their opposite ends are convexly curved. The hollow nozzles communicate with the interior of the body of the tool, which in turn is connected through the usual hollow wand or handle and flexible hose with a source of suction in a vacuum cleaner unit. This construction enables the several nozzles to penetrate the deep pile of a shag rug by parting the fibers and thus the nozzle openings are brought fairly close to the base of the rug and the air flow into the nozzles is able to entrain deeply embedded dirt. The shape of the nozzles enables them to be moved with reasonable ease between and over the fibers and to comb out the fibers as the tool is moved.

3,745,604

TOOL FOR CLEANING AND RAKING SHAG TYPE RUGS

Edwin Fitzwater, Rahway, N.J., assignor to General Signal Corporation, Rochester, N.Y.

Filed Sept. 3, 1971, Ser. No. 177,724
Int. Cl. A47l 9/06
U.S. Cl. 15—397 **9 Claims**



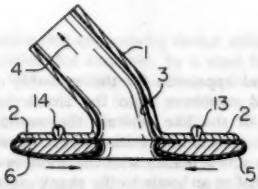
There is disclosed in this application a tool for cleaning shag-type rugs comprising a nozzle having an exhaust opening adapated to be attached to a vacuum motor and a face portion adapted to contact rhe rug. Formed on the face portion are a plurality of air inlet openings which communicate with the exhaust opening and a plurality of closed tines so that the rug may be concurrently cleaned and raked. Also formed on the face portion are a plurality of open tines which do not project as far as the closed tines and which communicate with the exhaust opening to enhance the cleaning ability of the nozzle.

3,745,605

APPARATUS FOR CLEANING THE TEXTILE ARTICLES

Hilde Schwab nee Gitschel, and Heinz Zembold, both of Dusseldorf, Germany, assignors to Nippon Seal Co., Ltd., Osakaski, Osaka, Japan

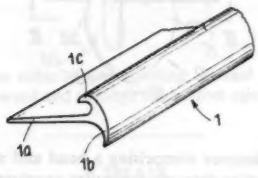
Filed May 17, 1971, Ser. No. 144,081
Claims priority, application Germany, May 20, 1970, P 20 24 616.6
Int. Cl. A47l 9/06
U.S. Cl. 15—400 **4 Claims**



The brush apparatus is used for cleaning textile articles, particularly carpets and other similar kinds of floor coverings as well as padded furnitures. The apparatus, which is movable to and fro along the surface to be cleaned, is used in a combination with a mechanical or pneumatic take-up device for the removal of dust, fluffs and the like. A plurality of bristle cushions surround the take-up openings of the devices and include a pad of even-length and soft material bristles and addi-

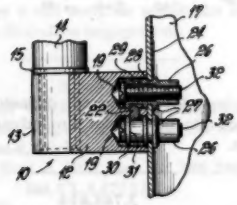
tional bristles intermingled within the even-length bristles. The additional bristles are of a greater length and of a harder material than the even-length bristles and give the pad a striped appearance.

3,745,606
EDGE LATH FOR STAIR STEP
William Matthey, 1 avenue du Theatre, Lausanne, Switzerland
Filed Feb. 14, 1972, Ser. No. 225,755
Int. Cl. A47g 27/04
U.S. Cl. 16—10 **2 Claims**



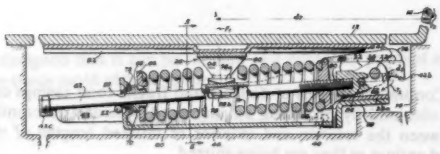
An edge lath for securement of a moquette, a carpet or any other sheet shaped covering material on the edge of a stair step. The lath has a T shaped cross section, the leg of the T capable of being applied on the upper face of the step while one of the wings of the T is applied against the rise or the front edge of the step, the other wing of the T being upwardly directed when the lath is installed and bent at right angle so as to provide, with the leg ot the T, a groove for receiving the edge of the covering sheet material of the step.

3,745,607
MOUNTING SYSTEM
Herbert Cleff, Ennepetal-Voerde, Germany, assignor to Dorma-Baubeschlag GmbH & Co. KG, Ennepetal-Voerde, Germany
Filed Oct. 7, 1971, Ser. No. 187,406
Int. Cl. E05d 5/02
U.S. Cl. 16—158 **6 Claims**



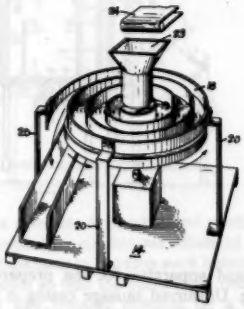
A hinge is provided having two hinge portions which are pivotably connected. Each of the hinge portions has a free end provided with an abutment surface which is to be abutted against a window, door or the like and a frame or wall to which the window or door is to be mounted. Each of the abutment surfaces has a pair of vertically spaced bores extending inwardly therefrom, and a transverse bore extends between the vertically spaced bores and communicates with both of them. Connecting members are mounted in the door, window or the like on the one hand and in the frame or wall on the other hand, and are each received in one of the bores of the respectively associated hinge member. A wedge member is then driven into the transverse bore of the respective hinge member so as to wedgingly engage the connecting members located in the respectively vertically spaced bores and to establish a mounting in this manner.

3,745,608
COUNTER BALANCE SUPPORT
Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Nov. 17, 1971, Ser. No. 199,583
Int. Cl. E05f 1/12
U.S. Cl. 16—190 **7 Claims**



A mechanism for counterbalancing a cabinet lid for swinging movements about an independent, relatively spaced hinge support; the mechanism being characterized as producing substantially no frictional binding forces on the lid hinge support or forces tending to disconnect the mechanism from the lid, while the lid is in its normal closed position.

3,745,609
APPARATUS FOR REMOVING SHELLS FROM CRUSTACEA
James Martial Lapeyre, 13 Richmond Place, New Orleans, La.
Filed Mar. 22, 1972, Ser. No. 236,918
Int. Cl. A22c 29/00
U.S. Cl. 17—73 **8 Claims**



The present disclosure is directed to a method and apparatus for removing shells from crustacea in which the crustacea is compelled to travel a predetermined path while being subjected to an incising action to open the shells and while moving at an increasing rate of speed during the incising action at the conclusion of which the meats and shell fragments are separated by floatation.

3,745,610

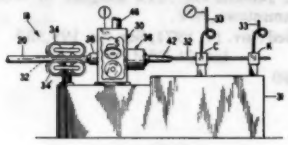
METHOD AND APPARATUS FOR SHIRRING DELICATE AND FRAGILE FOOD CASINGS

Algimantas Povilas Urbutis, 6519 South Albany Avenue, Chicago, Ill.

Division of Ser. No. 797,423, Feb. 7, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 117,062

Int. Cl. A22c *13/00*

U.S. Cl. 17—42 **3 Claims**



Continuous lengths of delicate and fragile food casings can be obtained by providing an increased pressure differential between the interior and exterior of inflated lengths of the food casings as they are being shirred.

3,745,611

APPARATUS FOR SHIRRING ARTIFICIAL SAUSAGE CASING

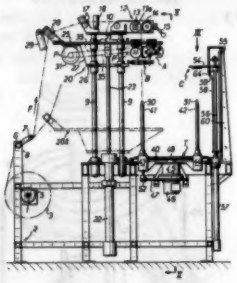
Gilbert Patouillard, Beauvais, France, assignor to Societe Viscara, Paris, France

Filed Mar. 17, 1971, Ser. No. 125,056

Claims priority, application France, Mar. 25, 1970, 7010669

Int. Cl. A22c *13/00*

U.S. Cl. 17—42 **14 Claims**



A method and apparatus for the preparation of shirred sausage casing. Unshirred sausage casing is threaded onto a vertical mandrel at a shirring station and then inflated. A vertically displaceable shirring head has a starting position adjacent to the lower end of the mandrel and moves upwardly during shirring and at least part of its weight being exerted against the shirred casing thereby effecting its pre-compression. The shirred, pre-compressed sausage casing is then severed from the adjacent unshirred portion of the casing whose end is at the same time flared. The shirred, pre-compressed casing still in position on the mandrel is then brought to a compression station where it is further compressed.

3,745,612

RESILIENT FASTENERS

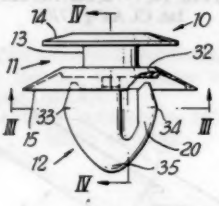
Clifford Alexander Seckerson, Iver Heath, England, assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 22, 1971, Ser. No. 126,747

Claims priority, application Great Britain, Mar. 23, 1970, 13,815/70

Int. Cl. F16h *19/00*

U.S. Cl. 24—73 PF **4 Claims**



A resilient fastener comprising a head and a compressible shank for insertion through a circular aperture in a panel in which the shank includes a central stem which extends longitudinally of the shank from the head so as to include the axis of the shank and two longitudinally extending flanges which are joined to the stem in such a manner that they are resiliently compressible towards the stem, the shank being substantially S-shaped on any transverse section taken at any point over a major part of the length thereof. Preferably, the central stem has two generally parallel major planar faces and the flanges are compressible in a direction normal to the said planar faces in the manner of a concertina action.

3,745,613

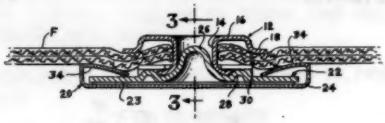
DECORATIVE SHIELD OR BUTTON ASSEMBLY

Domenic John Daddona, Jr., Waterbury, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 23, 1971, Ser. No. 211,315

Int. Cl. A44b *1/42*

U.S. Cl. 24—94 **2 Claims**



Assembly includes one-piece deflector plate-retaining means in which attaching eyelet is rolled outward to make assembly secure.

3,745,614

TIE-KNOT UNIT

Chout Wun Tsang, 35 Main King Bldg., 11/Floor Man Ying St., Jordan Road, Kowloon, Hong Kong

Filed Feb. 22, 1971, Ser. No. 117,289

Claims priority, application Great Britain, Feb. 23, 1970, 8,517/70

Int. Cl. A47b *19/00*

U.S. Cl. 24—153 **4 Claims**

A tie-knot unit formed by an outer casing including forward and rear casing members hingedly interconnected at their upper ends. The casing has two upper openings, aligned on opposite sides of the hinge, and a bottom opening through which the ends of the tie can hang. A separator means is provided

within the casing to separate that portion of the tie entering through one upper opening from that portion of the tie entering through the other upper opening, as said portions pass downwardly toward and through the bottom opening.

3,745,615

DEVICE FOR FASTENING DECORATIVE RODS TO UPRIGHT RODS OF METAL RAILINGS

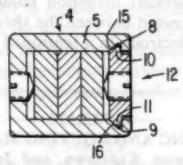
Rudolf Oberreich, Kaiserstrasse 57, D-5800 Hagen, Germany

Filed Feb. 7, 1972, Ser. No. 224,078

Claims priority, application Germany, July 22, 1971, G 71 28 167.9

Int. Cl. E04b *1/48*; A44b *21/00*

U.S. Cl. 24—243 B **8 Claims**



A U-shaped member is slid about the decorative and upright rods of a railing, at a desired point of connection, to partially enclose the rods. A bridging member is then engaged with the U-shaped member at the open end thereof to complete the enclosure. At least one of the members carries a setscrew designed to engage a rod member within the enclosure and urge all of the rods into close engagement.

3,745,616

CLAMP WITH IMPROVED LATCH

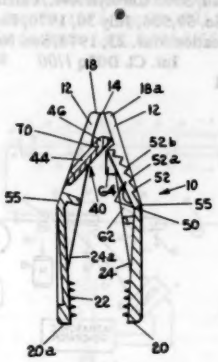
John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Sept. 5, 1972, Ser. No. 286,296

Int. Cl. A47j *51/14*

U.S. Cl. 24—255 SL **17 Claims**

A one-piece, molded, plastic clamp is formed of a pair of clamping members hingedly joined together so that the clamp is closed when the free ends of the members are urged together. The clamp includes a central opening generally symmetric about the hinge and extending into both members. The clamp is held closed by a progressive latch means having a T-shaped latch hingedly extending into the opening from one member for selective engagement by its cross portions with a pair of stepped keeper ramps formed in the other member on each side of the opening. The keeper ramps are inclined inwardly toward the latch with the steps opening downwardly for receiving the bottom edges of the T-cross portion. The steps of each ramp form an arc so that the latch is cammed successively over the steps to achieve maximum wedging of the material between the clamp members. The entire clamp is so designed that it can be molded as a complete product in a two-piece mold without the use of cams.



3,745,617

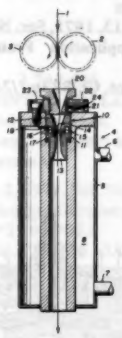
APPARATUS FOR BULKING YARN

Leonard A. Smith, Jr., Greenwood, S.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 6, 1972, Ser. No. 231,915

Int. Cl. D02g *1/16*

U.S. Cl. 28—1.4 **5 Claims**



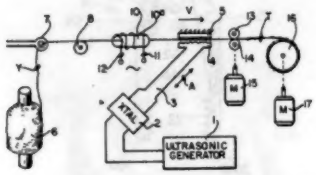
This invention provides apparatus and method of treating synthetic thermoplastic continuous filament yarns having latent crimp or bulkiness to develop such bulkiness and to entangle the filaments so that the yarns from one treating position to another like treating position on a yarn texturing machine is uniformly bulked and tangled. This is accomplished by separately gear crimping at least two yarns. Immediately after the crimping operation the yarns are passed through separate fluid treating jets wherein the crimped yarns are bulked and the filaments thereof are entangled. The thus-treated yarns are separately collected in a uniform manner. At least one of the yarns is deflected slightly just prior to entering the jet by means of an adjustable yarn guiding surface to carefully position the yarn in the jet and to control the uniformity of the fluid treatment from one yarn end to another.

3,745,618

METHODS FOR TEXTURIZING YARNS AND THE LIKE

Glenn A. Burklund, 3903 Carolyn Ave., Fairfax, Va.

Division of Ser. No. 59,506, July 30, 1970, Pat. No. 3,672,012.
This application Mar. 23, 1972, Ser. No. 237,291
Int. Cl. D02q 1/00
U.S. Cl. 28—72.1 7 Claims



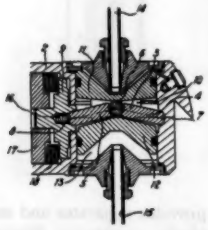
Improved technique for texturizing synthetic filaments, fibers and yarns by the application of high frequency impact thereto to impart bulk and/or stretch characteristics, each impact being applied to the yarn at an acute angle with respect to its axis and in such a way that each fiber or filament is peened asymetrically on one side to cause curling or bending while at the same time being advanced through the texturing zone by the impact, and between impacts the yarn is fully released by the impact applying members in the zone so that the yarn can assume a relaxed position whereby any build up of twisting of the yarn is avoided.

3,745,619

LOCKING DEVICES

Roger Guilleray, La Haye Les Roses, France, assignor to Hure S.A., Bagneux, France

Filed Sept. 13, 1971, Ser. No. 179,766
Claims priority, application France, Sept. 15, 1970, 7033421
Int. Cl. B23q 1/28
U.S. Cl. 29—1 A 4 Claims



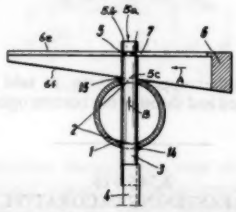
The invention is concerned with providing a hydraulically operated device for locking two relatively movable parts together in a manner which is not disturbed by loss of hydraulic pressure due to failure or shut-down of the machine, the device comprising a toggle-joint which is driven over and back across the dead point by hydraulic pressures, a small section of the movement of the toggle ends being used to take up the play for clamping and the remainder of the movement being used to compress an energy storage device to provide sustained clamping forces.

3,745,620

METHOD OF MAKING CORONA-DISCHARGE ELECTRODE STRUCTURES AND ASSEMBLY THEREFORE

Hermann Koy, Frankfurt Main, and Ivan Keserin, Hochst, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt/Main, Germany

Filed Aug. 31, 1971, Ser. No. 176,524
Claims priority, application Germany, Sept. 10, 1970, P 20 44 738.5
Int. Cl. H01j 9/36
U.S. Cl. 29—25.16 7 Claims



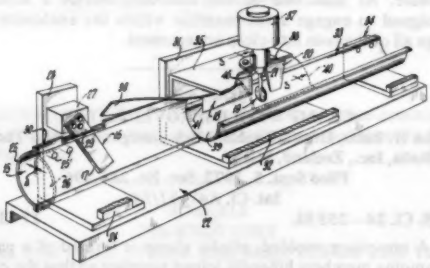
A method of making corona-discharge electrode structures for electrostatic precipitators in which the individual elongated electrodes are inserted in a frame, anchored at one end to the latter by, for example, welding, inserted through a limb of the frame opposite the weld site, tensioning against the frame by insertion of a wedge between a shoulder or abutment of the electrode lying beyond this limb of the frame and the frame, and welding the tensioned electrode to the frame. The assembly of the present invention includes the removable wedge which is received between the shoulder and the frame for retaining the electrode in a tensioned state prior to welding.

3,745,621

SLITTING AND ROUTING MACHINE

Theodore E. Andrews, Kutztown, and John J. Weller, Emmaus, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 15, 1971, Ser. No. 208,200
Int. Cl. B23p 23/02
U.S. Cl. 29—33 D 22 Claims



The invention contemplates a method and apparatus for producing a bore of prescribed size and shape in elongated stock which is to be or has been longitudinally cut into separate halves, the bore being completely and correctly defined by segments cut into both halves. The invention has particular application to pipe or conduit insulation, as a relatively hard foamed urethane or other plastic, wherein accurate fit and insulation-thickness uniformity are significant factors.

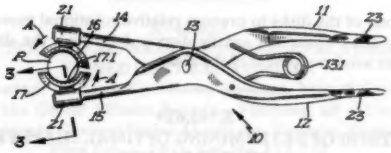
In the forms described, the bore is made by a routing tool, which is driven on a rotary axis which is radial to the longitudinal axis of the stock or workpiece, the tool shank passing between slightly separated matching halves of the workpiece. Guide-blade means in the plane of the bit axis and of the workpiece axis assures accurate separation for the routing operation, and for unsevered stock the guide-blade means includes a cutting edge operative just prior to the routing operation.

3,745,622

BATTERY LUG CLEANING TOOL

Ferdinando DeAmicis, 6912 Upton Ave. S., Minneapolis, Minn.

Filed Sept. 14, 1971, Ser. No. 180,302
Int. Cl. B23d *71/00*
U.S. Cl. 29—78 R **6 Claims**



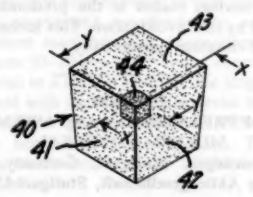
A storage battery terminal post cleaning tool with handles and arms mounting jaws tapered and arcuately curved to embrace the peripheral surfaces of battery terminal posts; the curvature being less than the curvature of the battery post peripheries to progressively vary the various areas of the abrading faces in engagement with the terminal post during oscillation of the tool in opposite directions; the jaws being swivelly connected to the arms by balls affixed on the jaws and inserted in sockets in the arms and retained thereon by arm-encompassing spring clips which traverse and obstruct the open ends of the socket openings to confine the balls therein.

3,745,623

DIAMOND TOOLS FOR MACHINING

Robert H. Wentorf, Jr., Schenectady, and William A. Rocco, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 26,660, April 8, 1970, abandoned. This application Dec. 27, 1971, Ser. No. 212,408
Int. Cl. B26d *1/00*; B21k *21/00*
U.S. Cl. 29—95 B **18 Claims**



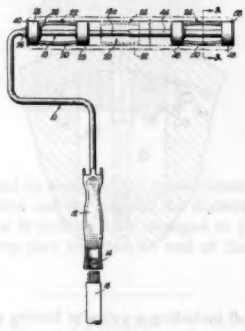
Diamond tools and superpressure processes for the preparation thereof are described wherein the diamond content is present either in the form of a mass comprising diamond crystals bonded to each other or of a thin skin of diamond crystals bonded to each other. In each instance the diamond content is supported on and directly bonded to an extremely stiff sintered carbide substrate in order to provide mechanical support therefor to more effectively utilize the high elastic modulus of the diamond.

3,745,624

EXTENSIBLE PAINT ROLLER FRAME

Robert D. Newman, 400 Walnut, Greenwood, Mo.

Filed Jan. 27, 1972, Ser. No. 221,339
Int. Cl. B05c *1/08*; B44d *3/28*
U.S. Cl. 29—116 R **9 Claims**



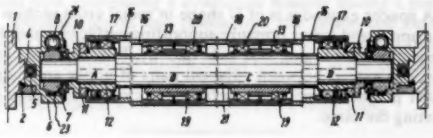
An extensible paint roller frame has a pair of independent frame units rotatable on a spindle of the paint roller, one of the units being confined against other than rotative motion and the other being supported entirely by the spindle for sliding movement in alternate directions along the unobstructed remaining length of the spindle to vary the effective length of the frame. Freedom from abutments and fasteners on the remaining length of the spindle and elimination of the need for a supporting connection between the two units allows the shiftable unit to be completely removed from the spindle and replaced thereon with ease to facilitate installation of a paint applicator sleeve.

3,745,625

JOINTED ROLLER

Heinz Jaegers, Duisburg-Buchholz, and Horst Quenter, Kaarst, both of Germany, assignors to Joseph Eck & Sohne, Dusseldorf-Heerdt, Germany

Filed July 2, 1971, Ser. No. 159,177
Claims priority, application Germany, July 8, 1970, P 20 33 740.0; Feb. 24, 1971, P 21 08 702.5
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 AD **9 Claims**

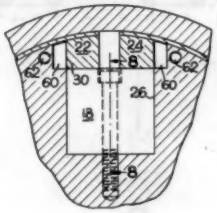


A jointed or bendable roller adapted to be used, among other things, as a full-width roller in a calender in order to prevent folds, fluttering edges, and undulations in web material, such as paper, by stretching widthwise, said roller having at least two roller shells which are rotatably mounted on a straight roller shaft and which are set at an angle to each other. The roller further includes means for adjusting the degree or amount of bending between adjacent roller shells.

3,745,626
COATING ROLL

Andrew M. Bray, Little Suamico, Wis., assignor to Magna-Graphics Corp., Dayton, Ohio

Filed Dec. 27, 1971, Ser. No. 212,452
Int. Cl. B21b *31/08*
U.S. Cl. 29—129 18 Claims

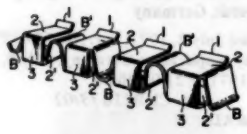


A coating roll including a cylinder having permanent magnetic holding members seated in slots provided in the cylinder and having magnetizable bars on each end of the mat and a flexible magnetizable backing sheet. The mat is held on the cylinder by the magnetic force of the magnetic members. A pair of adjusting wedges are provided to register the first magnetizable bar on the cylinder and a second pair of tightening wedges are provided to wedge the second magnetizable bar toward the first magnetizable member.

3,745,627
SPACER EXPANDER AND PROCESS THEREFOR

Mikio Miyamoto, Omiya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Division of Ser. No. 54,279, July 13, 1970, Pat. No. 3,663,030. This application Aug. 5, 1971, Ser. No. 169,447
Claims priority, application Japan, July 12, 1969, 44/54831
Int. Cl. B23p *15/06*
U.S. Cl. 29—156.6 1 Claim



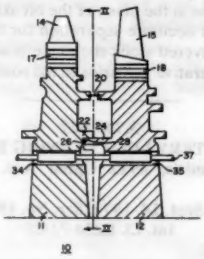
A spacer expander is of U shape in radial cross section and has upper and lower pressure supporting surfaces which have projections for urging side rails radially. Intermediate curved portions extend between adjacent pairs of upper and pairs of lower pressure supporting surfaces for circumferentially connecting the same.

3,745,628
ROTOR STRUCTURE AND METHOD OF CONSTRUCTION

William F. Stahl, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,141
Int. Cl. B23p *15/04*
U.S. Cl. 29—156.8 R 3 Claims

A rotor structure having at least two radially extending rotor disks. The disks are adjacent to each other and have a knurled portion disposed on one of the disks. The disks are compressed, thereby embossing the knurled portion onto at least one of the disks to prevent relative rotational movement of the disks. Bolts are axially disposed through the disks to prevent axial movement of the disks.



3,745,629
METHOD OF DETERMINING OPTIMAL SHAPES FOR STATOR BLADES

George Pask, Stanton-By-Bridge, and Norman Robert Robinson, Duffield, both of England, assignors to Secretary of State for Defence, London, England

Division of Ser. No. 47,514, June 18, 1970, abandoned. This application Apr. 12, 1972, Ser. No. 243,223
Int. Cl. B23p *15/02*; B23q *17/00*
U.S. Cl. 29—156.8 B 4 Claims

In an effort to prevent vibration-induced cracking of stator blades of the type that are secured at their radially inner and outer ends a complete stator assembly is made up and its vibration characteristics are investigated. The normal blades are then replaced by blades which are curved to the shape assumed by the normal blades in the predominant mode of vibration found by the investigation. This technique has been found to reduce vibration substantially.

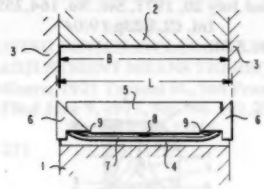
3,745,630
METHOD OF PREASSEMBLY AND ASSEMBLY OF A MULTIPARTITE SEAL

Wolf-Dieter Bensinger, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Dec. 14, 1971, Ser. No. 207,899
Claims priority, application Germany, Dec. 16, 1970, P 20 61 933.4
Int. Cl. B23p *15/06*
U.S. Cl. 29—156.6 4 Claims

A method for preassembling and assembling a multi-partite sealing bar and associated spring for the piston of a rotary piston engine provided with a housing casing and lateral disks in which the parts of the sealing bar are preassembled, utilizing an adhesive dissolving under heat in such a manner that the over-all length of the sealing bar is slightly larger than the

width of the housing casing; the sealing bar is then reduced in its length to the width of the housing casing when the lateral



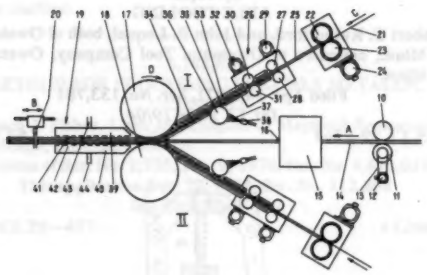
disks of the engine are assembled onto the housing casing which cause at least some of the bonded connections to be broken.

3,745,631

METHOD AND APPARATUS FOR MANUFACTURING FINNED HEAT EXCHANGERS

Karl Gunnar Jonason; Karl Harry Karlsson, both of Vasteras, and Ake Gustaf Vilhelm Remning, Finspang, all of Sweden, assignors to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Feb. 4, 1971, Ser. No. 112,732
Claims priority, application Sweden, Feb. 5, 1970, 1498/70
Int. Cl. B21d *53/02*; **B23k** *5/22, 31/02*
U.S. Cl. 29—157.3 A **15 Claims**



A method and apparatus for producing highly effective heat exchanger elements of the type which comprise corrugated surface enlarging members of strip material fixed to thin-walled substrates. The strip material, which can be either pre-corrugated or corrugated synchronously with the heat-exchanger element manufacturing process and which has a thickness of from 50–10μm, is advanced concurrently with a substrate material to a station at which the strip is lightly held in firm abutment with the substrate material by means of an impringing stream of gaseous medium and simultaneously metallurgically bonded to the substrate. The composite product is then cut into lengths to form finished heat exchanger elements.

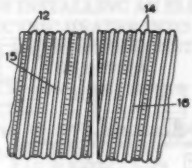
3,745,632

METHOD OF MAKING A COMBINED EXHAUST PIPE AND SILENCER

Eino Kalervo Malkki, Etela Hesperiankatu 18 A 2, and Valentin Silde, 3 Linja 23 B, both of Helsinki, Finland

Filed June 21, 1971, Ser. No. 155,165
Int. Cl. B23p *15/26*
U.S. Cl. 29—157 R **4 Claims**

A method of making a combined exhaust pipe and silencer for a motor vehicle includes the steps of helically bending a metal strip into a tubular form, profiling the metal strip to form a crest which acts as a screw thread and closing the metal strip with a sold seam to produce a helically seamed tubular exhaust pipe. The exhaust pipe and a suitable silencer are assembled and joined by means of the screw thread. When shaping the exhaust pipe and the silencer the diameter of the helically seamed tube is continuously changed to provide a continuous connecting part between an end of the silencer and the exhaust pipe.

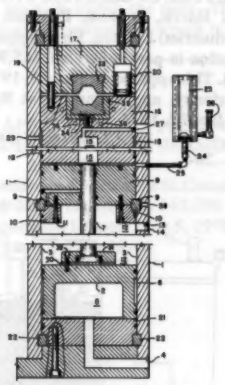


3,745,633

METAL PRESS

Cornelis Langewis, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 6, 1971, Ser. No. 205,145
Int. Cl. B23p *19/00, 11/00*
U.S. Cl. 29—200 B **4 Claims**



An apparatus particularly suited for securing a sleeve of substantial thickness such as a hollow core sacrificial anode to a metal pipe, comprising a cylindrical housing having a pressure activated piston and piston rod, the piston rod being aligned to exert pressure through a hydraulically-filled chamber on a movable piston. A die mounted in the center of the movable piston cooperates with a die mounted in a fixed platen to compress a metal sleeve around a metal pipe.

3,745,634

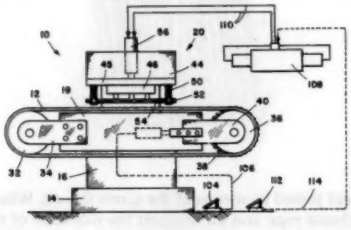
RUBBERIZED METAL REINFORCED BELT GROMMET INSTALLING MACHINE

William J. Vargo, 1631 Huguelet St., Akron, Ohio

Filed Oct. 13, 1971, Ser. No. 188,725
Int. Cl. B23p *19/00, 11/00*
U.S. Cl. 29—200 P **11 Claims**

The invention relates to an apparatus for affixing grommets to rubberized reinforced belts which have been previously punched with holes for receiving the grommets. The apparatus

includes rolls for supporting the belt and advancing it past the grommet-installing station. The installing station includes a pair of forming dies and a positioning pin. The first forming die presses the grommet and the retaining plate firmly onto the belt and paritally bends the tabs of the grommet outwardly. The second forming die completes the bending of the



tabs so that they lie parallel to the retaining plate. The locating pin passes through an installed grommet to precisely locate the holes in the belt in the grommet relative to the forming dies. The dies and the locating pin are carried on a common ram so that the initial forming or bending of the grommet tabs is performed at one hole while the final bending is simultaneously performed at an adjacent hole.

3,745,635

IMPROVEMENTS IN AND RELATING TO MANUFACTURE OF ELECTRIC STORAGE BATTERIES

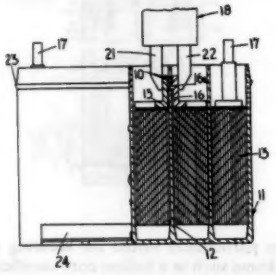
John Derek Harris, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation-in-part of Ser. No. 865,921, Oct. 13, 1969, abandoned. This application Jan. 20, 1972, Ser. No. 219,365

Claims priority, application Great Britain, July 4, 1968, 31,880/68; Jan. 22, 1971, 2,916/71

Int. Cl. H01m *35/18*

U.S. Cl. 29—204 **7 Claims**



Apparatus for assembling, positioning and securing a battery casing and lid in the manufacture of electric storage batteries comprises a frame and first and second die parts movable relative to the frame and adapted to receive a battery casing or box and a recessed battery lid respectively. The die parts can be caused to retain the box and lid respectively and are movable between a separated position and a position in which the lid is accurately positioned on the box. A heater is movable relative to the frame between an inoperative position and an operative position in which the lid and the box can be moved into contact with the heater. The heater has a portion which, when the lid is moved into contact with the heater, engages an internal peripheral shoulder defined in the recessed battery lid to melt the shoulder, and said portion of the heater is undercut to the rear of the surface of the portion which engages the shoulder so that, when the lid is in contact with the heater, the wall of the lid adjacent the shoulder is not melted.

3,745,636

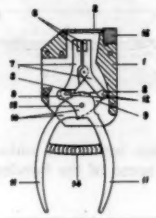
SLIDE FASTENERS

Ely Burstein, 204 Trinity Hall, Highlands, Johannesburg, Republic of South Africa

Filed July 20, 1971, Ser. No. 164,259

Int. Cl. B23p *19/04*

U.S. Cl. 29—207.5 SL **13 Claims**



A holder for sliders of the type used on slide fasteners (or zippers), the holder comprising a pair of jaws biased towards each other and arranged to engage a finger grip on a slider, and a support arranged to engage the body of the slider, the support and jaws being arranged such that as the jaws move towards each other the finger grip is engaged and moved or pulled in a direction away from the body of the slider which is located on the support, thereby opening any automatic locking device associated with the slider.

3,745,637

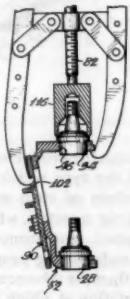
AXLE TOOLING

Robert C. Rutherford, and John R. Loquai, both of Owatonna, Minn., assignors to Owatonna Tool Company, Owatonna, Minn.

Filed Apr. 14, 1971, Ser. No. 133,781

Int. Cl. B23p *19/04*

U.S. Cl. 29—261 **6 Claims**



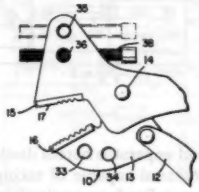
An adaptor plate for use in removal and installation of ball joints from a knuckle and a tool kit including the same. The plate includes elongated, arcuate slots arcuately arranged in the form of a circle for adjustable receipt of threaded studs on a knuckle so that the plate may be secured to the knuckle. The plate is further provided with a pair of oppositely located slots so that when the plate is secured to the knuckle, one of the slots will be adjacent one ball joint on the knuckle and the other slot will be adjacent the other ball joint. As a result, the slots may receive the jaws of a pulling tool for both ball joint removal and insertion operations without requiring reorientation of the plate on a knuckle between the two operations. The tool kit includes the foregoing adaptor plate along with a puller and a threaded pressure applying member which may alternately receive a first head for driving ball joints from the

knuckle, a second head having a cavity for pushing ball joints into the knuckle and an aligning nut for use in either of the operations.

3,745,638
CLAMPING DEVICE INCLUDING LATERAL ADJUSTMENT MEANS THEREON

Salvador A. Minera, 1921 Taraual St., San Francisco, Calif.

Filed June 9, 1971, Ser. No. 151,290
Int. Cl. B25b 27/14
U.S. Cl. 29—271 5 Claims

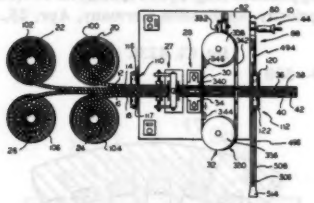


A clamping device is provided having a pair of adjustable members for gripping and clamping a surface therebetween. A bolt is threaded through an aperture formed on one of the members for laterally aligning an element adjacent the surface being clamped by the members. In this manner, an element such as an angle iron may be moved into position on a clamped surface such as a flat bar prior to welding the element to the surface.

3,745,639
METHOD FOR PROCESSING FLEXIBLE METALLIC CONDUIT

William J. Fisher, Lisle, Ill., assignor to Maynard Brauerman, Chicago, Ill., a part interest

Division of Ser. No. 1,735, Jan. 9, 1970, Pat. No. 3,672,015.
This application Dec. 27, 1971, Ser. No. 212,808
Int. Cl. B23p 17/00
U.S. Cl. 29—417 4 Claims

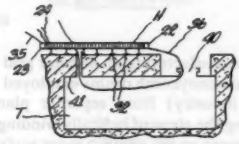


A machine and method for mechanically and simultaneously sizing and cutting multiple strands of flexible metallic conduit to desired lengths, and for facilitating the application of a fitting to either end of the respective resulting lengths, in which the conduit is simultaneously drawn, by a roller drive, from a number of rolls of same in parallel strands and is fed past a cutting station the conduit length desired, after which feeding of the conduit strands ceases and the conduit lengths are simultaneously severed from the row of strands by sawing. The machine includes a device for mechanically rotating the individual end fittings for the conduit length ends, whereby the machine operator can individually manipulate the individual conduit length ends to apply same to the device to permit the end fitting for same to be mechanically rotated into its fully seated position in the conduit end, and an attachment that permits the conduit wiring to be mechanically fed into same and cut off at the right length to complete the conduit assembly.

3,745,640
METHODS OF INSTALLING AN ELONGATED, FLEXIBLE, ELECTRIC HEATER INTO A MATERIAL STORAGE TANK, AND HEATER CONSTRUCTION FOR THE SAME

Steven J. Caroleo, Coraopolis, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 10, 1971, Ser. No. 206,666
Int. Cl. B23p 19/04
U.S. Cl. 29—433 7 Claims

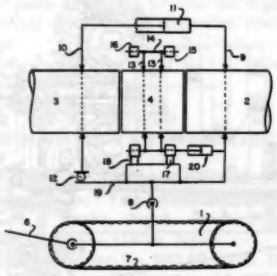


Methods of installing an elongated, flexible, electric heater into a material storage tank comprising attaching flexible cables to opposite ends of the heater while the same is disposed exteriorly of the tank, and utilizing such cables to guide the heater to a selected position within the tank. The invention also includes novel heater construction which is particularly useful in carrying out the methods.

3,745,641
METHOD AND APPARATUS FOR JOINING TWO ELEMENTS MADE OF METAL OR THERMOPLASTIC MATERIAL

Laurent L. Paolini, Residence Eugenie, 92 St.Cloud, France

Filed May 28, 1971, Ser. No. 148,090
Claims priority, application France, June 5, 1970, 7020675
Int. Cl. B23k 27/00
U.S. Cl. 29—470.3 10 Claims



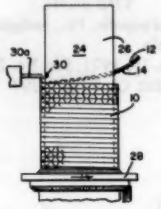
A method of joining by friction two elements of metal or thermoplastic material in which the elements are maintained immobile in axially aligned spaced relation and an intermediate member is inserted therebetween for rotational movement while in pressure contact with the ends of the tubular members to be joined and the surfaces are softened by friction after which rotational movement of the intermediate member is stopped while maintaining pressure contact until the weld sets.

3,745,642

METHOD OF MAKING ANNULAR GRID STRUCTURE

Lawrence A. Carlsmith, Amherst, N.H., assignor to Improved Machinery, Inc., Nashua, N.H.

Filed Nov. 5, 1971, Ser. No. 196,074
Int. Cl. B23k 31/02
U.S. Cl. 29—475 19 Claims



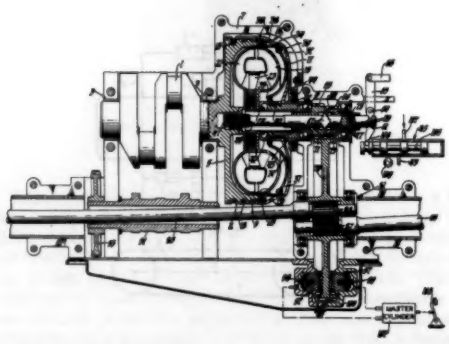
A method of manufacturing an annular grid structure (such as the cylindrical honeycomb drums employed by the pulp and paper making industry) from separate planar and waved strips, comprising the steps of helically winding the strips in alternate arrangement on the annular outer surface of a mandrel whereby the wound strips form an axial build-up of the grid structure on the mandrel, during said winding interconnecting adjacent coils of the strips by successively connecting portions of the planar strip with the waved strip as said portions of the planar strip are initially laid onto the mandrel while said portions being connected are substantially locally heated; and permitting the heated, connected portions of the planar strip to successively cool while wound on the mandrel, so as to stress the metal of the planar strips beyond the elastic limit.

3,745,643

METHOD OF MAKING A TORQUE TRANSMITTING UNIT

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 805,745, March 10, 1969, Pat. No. 3,590,966. This application Mar. 11, 1971, Ser. No. 123,320
Int. Cl. B21d 39/00; B23p 11/00
U.S. Cl. 29—510 5 Claims



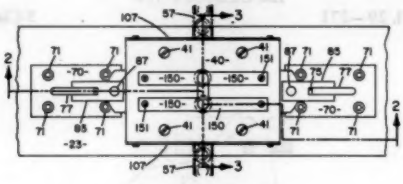
The housing of a torque transmitting unit is connected to a flywheel formed at the end of an engine crankshaft by an improved method comprising: forming an annular groove and radial holes in the outer periphery of the flywheel and subsequently deforming a portion of the housing which overlaps the flywheel into the grooves and holes to provide a fluid tight and rigid connection capable of transmitting engine torque into the input rotor.

3,745,644

METHOD FOR ATTACHING SOLDER RINGS TO WORK PIECES

Ross Moyer, Tully, and Fred Karandy, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 28, 1971, Ser. No. 166,792
Int. Cl. B21d 39/00
U.S. Cl. 29—515 4 Claims



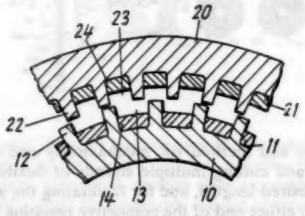
By the method and apparatus herein disclosed, solder rings, formed of solder material capable of taking a permanent set upon deformation, are fixed on work pieces for subsequent soldering to other work pieces. The perimeter of a solder ring, positioned at a predetermined location on a work piece, is engaged at two points spaced apart less than 180°. The solder ring is engaged by projections on forming blades or jaws moved toward a plane extending transversely of the ring. Sufficient force is applied at the points of engagement to bow a portion of the ring intermediate the points of engagement outwardly from the work piece and to draw the remainder of the ring in tight engagement about the work piece. Preferably the forming blades are each provided with a pair of projections for engaging opposite sides of the ring to bow the intermediate portions of the ring outwardly at each side thereof.

3,745,645

METHOD OF MANUFACTURE AND OPERATION OF RIBBED MEMBER FOR TREATMENT OF FIBROUS SUSPENSIONS

Klaus Kurth, and Hermann Rahmig, both of Heidenheim, Germany, assignors to J. M. Voith GmbH, Heidenheim (Brenz), Germany

Division of Ser. No. 817,658, April 21, 1969, abandoned. This application Aug. 5, 1971, Ser. No. 169,182
Claims priority, application Germany, Apr. 25, 1968, P 17 57 328.3
Int. Cl. B23k 19/00
U.S. Cl. 29—530 4 Claims



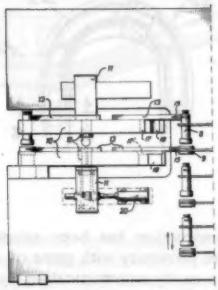
The specification discloses a method of making, and operating, a ribbed member for the treatment of fibrous suspensions passed between the ribbed member and a corresponding ribbed member while the members rotate relatively. According to the disclosure the ribs are made from 1 1/2 to 5 times the normal heighth of ribs on such members, while the grooves between the members are partly filled with a synthetic material solidified in situ in the grooves. As the ribs wear down in operation, the height of the synthetic material in the grooves is reduced to restore the groove depth for efficient operation of the members.

3,745,646

ARRANGEMENT IN TOOL CHANGES FOR STAMPING AND NIBBLING MACHINES AND THE LIKE

Erik Kristiansson, Partille, Sweden, assignor to Pullmax Aktiebolag, Gothenburgh, Sweden

Filed Oct. 7, 1970, Ser. No. 78,691
Int. Cl. B23q *3/155*
U.S. Cl. 29—568 8 Claims



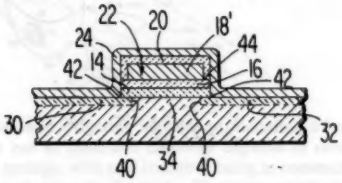
The present invention provides an automatic retooling means in machines working with two cooperating tools such as stamping, nibbling and like machines. The automatic retooling means provide for the transfer and return of pairs of tools from a magazine to their working position in a machine. The automatic retooling means include a plurality of superposed pairs of turret head plates to carry respective cooperating pairs of tools in the magazine in positions relative to their corresponding working position, and two parallel and simultaneously operating tool changing means arranged for transporting and returning the respective tools from the magazine to their working position in the machine.

3,745,647

FABRICATION OF SEMICONDUCTOR DEVICES

Edward Joseph Boleky, III, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1970, Ser. No. 78,806
Int. Cl. B01j *17/00*
U.S. Cl. 29—571 6 Claims



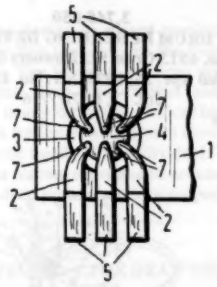
An insulated gate, field effect transistor is fabricated by covering a surface of a body of doped semiconductor material with a first layer of a dielectric material covered by a second layer of a dielectric material masking layer covered by a third layer of a highly doped semiconductor material. The third layer is defined to provide a gate electrode having exposed sides, and the sides are covered with a protective thermally grown oxide layer, the masking second layer preventing the growth of the oxide layer on the surface of the body. Then, using the gate electrode as a mask, the second and first layers are removed to provide a gate structure comprising the three layers, and to expose surface portions of the body adjacent to the gate structure. Thereafter, the body is doped to provide the source and drain regions of the transistor, and metal contacts are provided covering the exposed surface portions.

3,745,648

METHOD FOR MOUNTING SEMICONDUCTOR COMPONENTS

Richard Wiesner, 8011 Neukeferloh, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Mar. 18, 1970, Ser. No. 20,519
Claims priority, application Germany, Mar. 26, 1969, P 19 15 501.2
Int. Cl. B01j *17/00*
U.S. Cl. 29—580 5 Claims



Method of connecting an integrated circuit with outside electrical leads. The integrated circuit is inserted into an insulating substrate upon which electrical conductance paths are located. An electrical connection is established between the conductor paths on the substrate and the integrated circuit. A hole is etched into the substrate so that the inside ends of the conductor paths protrude freely beyond the edge of the hole. The integrated circuit is inserted into said hole and the ends of the conductor paths extending beyond the edge of the hole establish electrical contact with respective places of the integrated circuit.

3,745,649

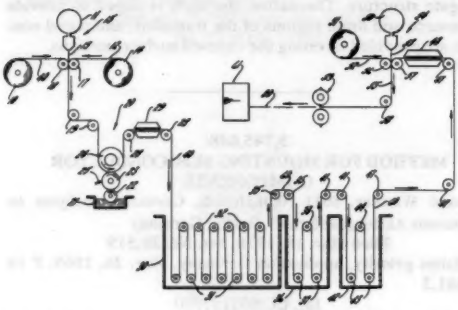
METHOD OF MANUFACTURING ELECTRIC SURFACE HEATERS

Kazuo Doi; Ryuzo Kato; Tadashi Matsumoto; Fujio Niizuma; Shigenori Kugumiya; Yasuo Tanaka, and Motoharau Kitamura, all of Osaka, Japan, assignors to Matsushita Denko Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 802,071, Feb. 25, 1969, Pat. No. 3,584,198. This application Apr. 14, 1971, Ser. No. 133,951
Claims priority, application Japan, Feb. 29, 1968, 43/16031; Mar. 12, 1968, 43/19314; Apr. 18, 1968, 43/31529; May 31, 1968, 43/45504; May 31, 1968, 43/45516; June 18, 1968, 43/51520; Apr. 18, 1968, 43/25976; Aug. 15, 1968, 43/58172
Int. Cl. H05b *3/00*
U.S. Cl. 29—611 18 Claims

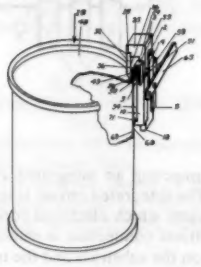
A method of manufacturing flexible electric surface heaters which involves laminating thermoplastic to a first side of a

sheet of electrically conductive metal foil, etching the metal foil according to a repetitive pattern on the foil to form repeti-



tive metal foil heater elements, and laminating thermoplastic to the second side of the etched metal foil.

3,745,650
DRUM DEHEADING DEVICE
Louis A. Derwin, 4513 Cross St., Downers Grove, Ill.
Filed Apr. 26, 1971, Ser. No. 137,526
Int. Cl. B67b *7/36*
U.S. Cl. 30—14 **7 Claims**

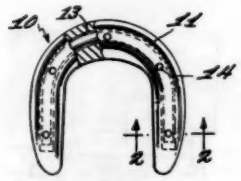


A device for cutting out an end wall of a container comprising a cutting blade mounted on a support which clamps to the container, and a handle pivoted to the body and connected by linkage for reciprocating the blade upwardly and downwardly to cut through the container wall.

3,745,651
PROCESS FOR ADJUSTING THE FIT OF AND REPAIRING DENTURES
Erick Hofacker, and Frauke Hofacker, nee Schulter, both of Lubeck, Germany, assignors to Etablissement Rivolan, Schaan, Liechtenstein
Filed Sept. 9, 1970, Ser. No. 70,909
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **11 Claims**

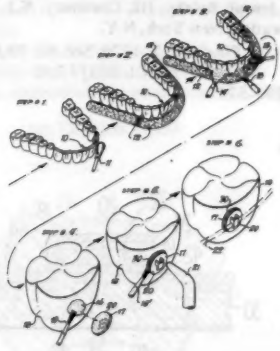
This invention relates to a process for adjusting the fit of dentures to the mouth when such adjustment is necessitated by changes in the shape of the jaw as a result of aging. The process is also suitable for repair of dentures which have been broken. The process involves the spraying of the denture with a catalyst solution followed by application of a synthetic polymer dissolved in the corresponding monomer which hardens in a short period of time, while in contact with the mouth. As a result, adjustment takes place and a perfect fit between the denture and the mouth is achieved.

3,745,652
DENTURE ADHERENCE DEVICE
Roy Alderman, 700 Carriage Hill Rd., Virginia Beach, Va.
Filed May 8, 1972, Ser. No. 251,260
Int. Cl. A61c *13/24*
U.S. Cl. 32—3 **11 Claims**



A denture construction has been adapted for retaining dentures in secure proximity with gums of a user by suction. The denture has a cavity communicating through an aperture with a surface of the denture which engages the gums during use, while a temperature responsive expandable-contractable means associated with the cavity changes the size of the cavity in accordance with temperature to thereby expel air from the cavity upon heating to above body temperature. The means creates a reduced pressure in the cavity upon cooling to body temperature while said aperture is in contact with the gums.

3,745,653
METHOD OF ORTHODONTIA
Matthew E. Cohl, 323 Evans St., Apt. G., Williamsville, N.Y.
Filed Dec. 6, 1971, Ser. No. 205,020
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **6 Claims**



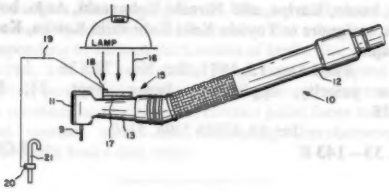
A method of attaching a bracket to a tooth comprising the steps of providing a bracket through which ultraviolet light can be transmitted, applying an adhesive which hardens when exposed to ultraviolet light to an area where said bracket is to be secured to said tooth, placing said bracket on said tooth, and exposing said adhesive to ultraviolet light by directing ultraviolet light through said bracket to harden said adhesive and thereby bond the bracket to said tooth. An orthodontic bracket installation comprising a transparent bracket secured to a tooth with transparent cement.

3,745,654

PAIN-ALLEVIATING APPARATUS FOR DENTAL DRILLING

Irving A. Ellman, 558 Willow Ave., Cedarhurst, N.Y.

Filed Mar. 21, 1972, Ser. No. 236,666
Int. Cl. A61c 1/10
U.S. Cl. 32—27 9 Claims



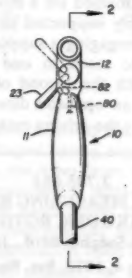
Apparatus is described for reducing pain during dental drilling by introducing electric current into the tooth via the drilling bur. The apparatus takes advantage of the high intensity lamp present to illuminate the drilling area by providing on the handpiece a photo-responsive device for generating or controlling the voltage or current applied to the bur. Various modifications are described for different kinds of handpieces.

3,745,655

ENDODONTIC IRRIGATING INSTRUMENT

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio

Filed May 28, 1971, Ser. No. 147,769
Int. Cl. A61c 3/00
U.S. Cl. 32—40 R 13 Claims



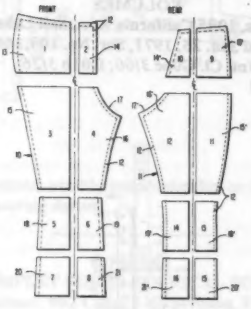
An endodontic irrigating instrument including a body portion which has at least one chamber capable of receiving a disposable syringe, with said chamber being in communication with a through bore in the body. The instrument also has a second through bore in its handle which can be connected to a vacuum source and has a valve which is movable between a position in which the bore leading from the syringe chamber is connected to the through bore of the body to a position in which the bore in the handle is in communication with the through bore of the body. The operative end of the instrument is adapted to receive a disposable needle which communicates with the through bore of the body. The instrument is then capable of selectively performing variable and different functions through a common orifice. The instrument also can include a heating element in association with the syringe chamber to preheat the solution contained in the syringe.

3,745,656

GARMENT PATTERN MAKING DEVICE AND METHOD

Josephine T. Sweeney, Melbourne, Fla., assignor to Warren C. Huff, Arlington, Va.

Filed May 10, 1971, Ser. No. 141,637
Int. Cl. A41k 3/015
U.S. Cl. 33—14 1 Claim



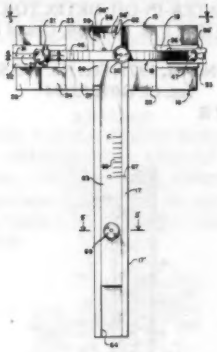
A pattern making device or means particularly for pants embodies a multi-section template for the front and rear sections of a single leg. The template sections are characterized by being totally free from one another and therefore individually movable in any direction. Critical hip measurement and crotch depth, as well as other garment dimensions, may be customized to suit the needs of an individual. When properly adjusted and sized a tracing is produced around the margin of the template to produce pattern sections on paper.

3,745,657

DRAFTING INSTRUMENT FOR DRAWING PARALLEL LINES

Francisco V. Gonzalez, 5705 N.W. 111th Ter., Hialeah, Fla.

Filed June 28, 1971, Ser. No. 157,221
Int. Cl. B43l 13/24
U.S. Cl. 33—110 6 Claims



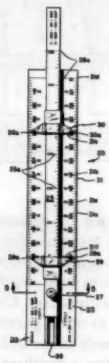
This drafting instrument provides a head assembly including spaced parallel members providing for a guide slot for the longitudinal movement of an advancing head slide. This head slide is held between the members by a transversely extending member that overlies the upper surface of the parallel members and which has an inclined forward edge. Extending laterally from the head assembly is a drawing edge arm in which there is a slide that can be laterally adjusted thereover and which has a corresponding inclined edge serving as a stop edge for the forward movement of the head slide by engagement of the forward inclined edge of its transverse member

with the inclined edge of the arm slide. By adjusting the arm slide any measured distance can be provided by which the spacing of the lines drawn over the transversely extending arm edge can be set to different distances.

3,745,658
APPARATUS FOR DETERMINING EARTHWORK VOLUMES

Pedro C. Raneses, 1085 California Ave., Salt Lake City, Utah

Filed Jan. 25, 1971, Ser. No. 109,146
Int. Cl. G06c *3/00*; **G01b** *5/26*
U.S. Cl. 33—121 **5 Claims**



Measuring and calculating apparatus with which engineering functions necessary to the designing layout and construction of structures such as roads, canals, etc., can be performed easily and accurately directly from a contour map of the area in which the structure is to be constructed, thereby eliminating the need for extensive on-site observations or time consuming template utilization.

3,745,659
WATER-IN-OIL DETECTOR

Charles Jui-Cheng Hsu, P.O. Box 466, Grand Central Station, New York, N.Y.

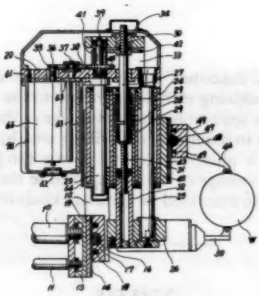
Filed Nov. 4, 1971, Ser. No. 195,550
Int. Cl. G01f *23/04*
U.S. Cl. 33—126.7 R **1 Claim**

A gauge device designed particularly to indicate the presence of water at the bottom of a storage tank used for various types of oils, the device consisting of a porous enclosure such as a sack made of woven fabric material, and which contains Sterculia lynchnophora Hance powder that is expandable in water but which is not affected by oil, the gauge being lowered to the tank bottom on a tethered line where it is retained a while for reaction with any present water and then pulled up for inspection.

3,745,660
MEASURING APPARATUS

Hiroaki Asano, Kariya, and Hiroshi Kobayashi, Anjo, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan

Filed Aug. 13, 1971, Ser. No. 171,626
Claims priority, application Japan, Sept. 21, 1970, 45/83075
Int. Cl. G01b *5/08, 5/10*
U.S. Cl. 33—143 R **7 Claims**

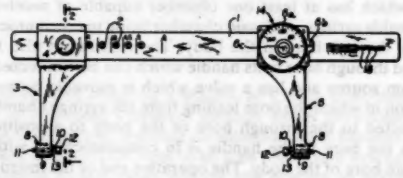


Measuring apparatus for measuring the diameter of a workpiece over an extended range thereof being provided with first and second feelers adapted to engage the workpiece and respectively being mounted on first and second hold blocks. To achieve a high measuring accuracy, the spacing between the first and second hold blocks is controlled by a single threaded portion only formed on a motor-driven feed shaft, the shaft being rotatably supported in the first of the hold blocks but threadedly engaging a support thereof for causing the first hold block to move in one direction and being threadedly engaged with the second of the hold blocks for causing it to move in an opposite direction by twice as far upon rotation thereof by the driving motor therefor.

3,745,661
BRAKE GAUGE FOR MEASURING BRAKE DRUMS AND BRAKE DISC ROTORS

Frank Atzberger, 97-26 Sutphin Blvd., Jamaica, N.Y.

Filed May 4, 1970, Ser. No. 34,049
Int. Cl. G01b *5/02, 5/12*
U.S. Cl. 33—147 J **10 Claims**



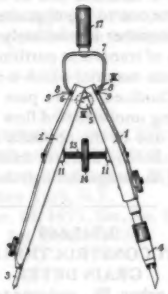
A brake gauge for measuring the internal diameter of brake drums, as well as the thickness of brake disc rotors, selectively, comprising a longitudinal bar having a plurality of spaced

openings along one end of the bar, the openings being marked corresponding to the various sizes of the internal diameter of the brake drum to be measured, a removable gauge arm selectively positioned on the bar and extending therefrom and having means for engaging in one of the openings, and a first contact point at the free end of the arm for engaging a brake drum to be measured. A fine adjustment gauge arm is positioned on the bar spaced from the removable gauge arm and includes a second contact point pointing in a direction opposite to the pointing of the first contact point. The fine adjustment gauge arm includes a fine gauging means. The bar includes a plurality of closely spaced recesses formed at the other end thereof corresponding to various thicknesses of brake disc rotors to be measured, and the removable gauge arm is adapted to be selectively positioned on this other end for engagement in one of the recesses, so that the first contact point faces toward the second contact point for measuring therebetween the thickness of a brake disc rotor.

3,745,662
BOW COMPASSES

Marcel Gentils, Ligny en Barois, France, assignor to Essiler International (Compagnie Generale d'Optique, Paris, France

Filed Nov. 16, 1972, Ser. No. 307,295
Claims priority, application France, Nov. 16, 1971, 7140919
Int. Cl. B43l *9/00*
U.S. Cl. 33—154 F **2 Claims**



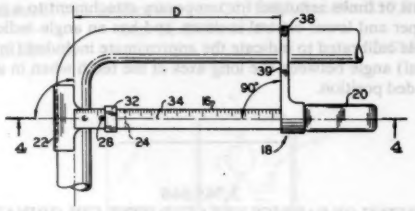
A pair of bow-compasses having the upper ends of its legs assembled by a bow-shaped spring engaging notches formed externally of said ends, the inner faces of said legs comprising each a disk-shaped projection of semi-circular configuration and an adjacent slot of same radius and substantially same width as the disk for receiving the disk of the other leg; a screw-rod with a central control knob has its screw-threaded ends of opposite pitch engaged in nuts, each nut being pivotally mounted on a pin of elongated cross-section and formed with a radial slot of a width slightly greater than the minor dimension of said cross-section, and smaller than the major dimension of said cross-section.

3,745,663
MEASURING DEVICE

Harry G. Dodge, Painesville, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed June 16, 1971, Ser. No. 153,531
Int. Cl. G01b *5/02*
U.S. Cl. 33—173 **4 Claims**

A measuring device comprising a conventional, metal measuring tape including a hook member adapted to be connected to the outer free end of the tape and having an arcuate shape corresponding with the shape of a cylindrical member which is to be measured. The hook member is located so that its center of curvature is aligned with the zero point of the tape. An arm assembly is carried on the tape housing for pivotal movement about the longitudinal axis of the tape. A surface of the arm is

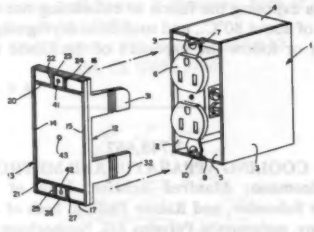


arranged to extend exactly perpendicular to the tape axis to serve as a measuring datum.

3,745,664
TEMPLET FOR ELECTRICAL BOXES

Lukas G. Altseimer, 902 Cedar Ln., Trenton, Pa.

Filed July 2, 1971, Ser. No. 159,353
Int. Cl. B25h *7/04*; **G01b** *3/14*
U.S. Cl. 33—174 G **3 Claims**

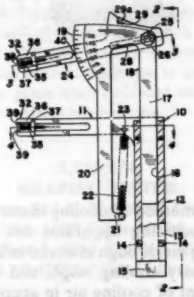


A stamp mounted on a relatively rigid support to which are attached flexible legs which provide for the stamp to be frictionally held on an electrical box so that the stamp can be contacted by the blind side of a panel. Upon contact the stamp prints guide lines on the panel corresponding to the shape of the box.

3,745,665
ORTHODONTIC GAUGE DEVICE FOR INDICATING INTERINCISAL ANGLES

Douglas J. Shilliday, 1501 London Dr., Columbus, Ohio

Filed Nov. 2, 1970, Ser. No. 85,993
Int. Cl. G01b *5/25*; **A61b** *5/10*; **A61c** *19/04*
U.S. Cl. 33—174 D **1 Claim**



A hand-operated gauge device used particularly by orthodontists and/or dental technicians for rapidly indicating

and/or checking the interincisal angle between the upper and lower central incisors of a patient during or following orthodontic correctional procedures. The gauge device comprises a system of interconnected fixed and movable linkage arms or limbs arranged for temporary attachment to a pair of upper and lower central incisors, and has an angle-indicating scale calibrated to indicate the approximate included (interincisal) angle between the long axes of the teeth when in an occluded position.

3,745,666

DRYING OF FABRICS TREATED WITH CHLORINATED HYDROCARBONS

Manfred Schulerer, Erbach/Odenwald, Germany, assignor to Bruckner-Apparatebau GmbH, Erbach/Odenwald, Germany

Filed Oct. 15, 1971, Ser. No. 189,798

Claims priority, application Germany, Oct. 21, 1970, P 20 51 671.6

Int. Cl. F26b 7/00

U.S. Cl. 34—12 **10 Claims**

A fabric treated with chlorinated hydrocarbons is dried initially by circulating hot air at a temperature not greater than about 80°C. until the moisture content of the fabric is less than the capacity of the fabric to contain moisture, following which the fabric is exposed to water vapour. A final drying stage comprises exposing the fabric to circulating hot air at a temperature of about 80°C., and such final drying stage may coincide with or follow the exposure of the fabric to the water vapour.

3,745,667

COOLING APPARATUS AND METHOD

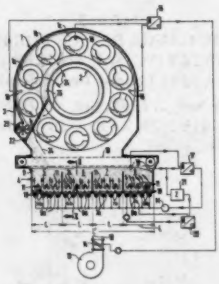
Otto Heinemann; Manfred Schefer, both of Ennigerloh; Werner Schossler, and Rainer Philipp, both of Ahlen, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Apr. 17, 1972, Ser. No. 244,381

Claims priority, application Germany, Apr. 20, 1971, P 21 19 006.7

Int. Cl. F26b 7/00

U.S. Cl. 34—20 **9 Claims**



Apparatus and method of cooling material, such as furnace fired clinkers, including apparatus for passing the same amount of cooling air through material in a secondary cooling stage and a primary cooling stage, and apparatus for controlling the amount of cooling air in accordance with the air pressure in the primary cooling stage and the amount and temperature of material in the secondary stage.

3,745,668

APPARATUS FOR INTERACTING PARTICULATE MATERIAL WITH GAS

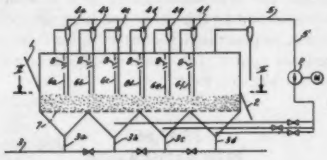
Angel Vian-Ortuno, and Vicente Martin-Municio, both of Madrid, Spain, assignors to Empresa Auxiliar De La Industria S.A., Madrid, Spain

Division of Ser. No. 622,018, March 2, 1967, abandoned. This application May 20, 1970, Ser. No. 39,060

Claims priority, application Spain, Mar. 1, 1966, 323698

Int. Cl. F26b 17/10

U.S. Cl. 34—57 A **13 Claims**



Apparatus for interacting particulate material with gas in which particulate material is fed into one end of an elongated chamber and discharged from the opposite end thereof, while gas under pressure is fed through the perforated bottom wall of the chamber so that the particulate material fed into the chamber will form a fluidized bed of such material therein which flows from the one to the opposite end of the chamber. The space in the chamber immediately above the bed is divided by a plurality of transverse partition in successive zones preventing particulate material which is carried by the gas upwardly out of the fluidized bed to pass from one to another zone while permitting unobstructed flow of the material in the fluidized bed from one to the opposite end of the elongated chamber to assure thereby uniform treatment of the particulate material during its pasage through the chamber.

3,745,669

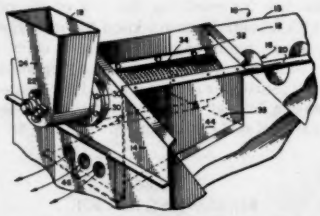
AUGER EXHAUST CONSTRUCTION FOR FORCED AIR GRAIN DRYER

Elmo R. Meiners, Anchor, Ill., assignor to M & W Gear Company, Inc., Gibson City, Ill.

Filed Oct. 20, 1971, Ser. No. 190,880

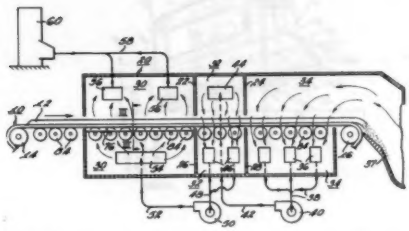
Int. Cl. F26b 19/00

U.S. Cl. 34—187 **5 Claims**



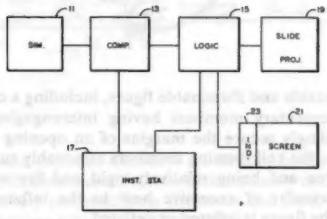
An auger exhaust construction for a forced air grain dryer includes a perforated screen positioned about the auger on the interior of the grain bin. A box with exhaust vents to the outside of the grain bin is positioned around the auger and the perforated screen to provide a chamber for receiving exhaust air through the screen and directing that exhaust air to the exterior of the bin through the exhaust vents.

3,745,670
GRATE CONVEYOR
Walter J. Hartwig, Oconomowoc, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed June 15, 1971, Ser. No. 153,171
Int. Cl. F26b 19/00
U.S. Cl. 34—217 4 Claims



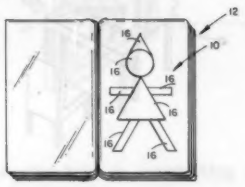
A traveling grate of the type used to convey material through an apparatus such as a dryer, a preheater, a cooler, a furnace, or the like, in which the pivotally mounted grate castings are provided with an "anti-flip leg" which cooperates with an underlying skid bar to prevent undesired pivotal movement of the grate castings to an open position in which they may become interlocked with contiguous grate castings.

3,745,671
AUTOMATIC MONITORING PROCEDURAL ITEMS IN A TRAINING DEVICE
Charles P. L. Mortimer, Binghamton, N.Y., assignor to The Singer Company, New York, N.Y.
Filed Mar. 15, 1971, Ser. No. 123,958
Int. Cl. G09b 9/08
U.S. Cl. 35—12 R 7 Claims



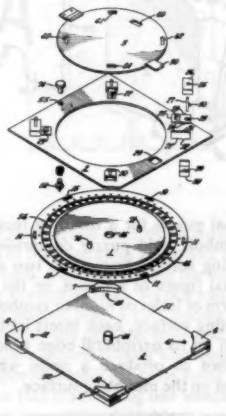
In a training device, such as an aircraft simulator, means for automatically displaying a list of tasks to be performed by a trainee in carrying out a designated procedural training item, indicating actual execution of each task and indicating any task performed in other than a predetermined sequence. The tasks associated with each item may be listed on slides, the appropriate slide being projected for viewing on a display screen having associated lights adjacent each task listing. The lights are turned on as the tasks are performed and blink on and off if a task is performed out of sequence. Alternate constructions disclosed include CRT displays and changing the color of the task name on the display to indicate performance or improper sequence.

3,745,672
COLORLESS PAINTING APPARATUS
Robert B. Duskin, 17 Barstow Road, Great Neck, N.Y.
Continuation-in-part of Ser. No. 64,210, Aug. 17, 1970, abandoned. This application Jan. 21, 1972, Ser. No. 219,816
Int. Cl. G09b 11/04
U.S. Cl. 35—26 6 Claims



Colorless painting apparatus having chemically treated sheets which are provided with an absorbent color-forming reactant, and a supply of colorless paints each of which chemically reacts with the absorbent color-forming reactant of each treated sheet for imparting different colored illustrations upon the sheet.

3,745,673
EDUCATIONAL GAME TOY
Bruce D. Jimerson, and Bonna J. Jimerson, both of 1815 Vallecito Dr., San Pedro, Calif.
Filed July 6, 1971, Ser. No. 159,612
Int. Cl. G09b 3/06
U.S. Cl. 35—9 A 8 Claims

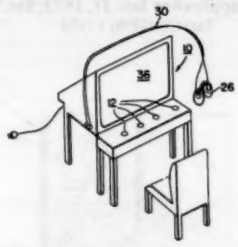


The simultaneous stimulation of different physical senses has been recognized by educators as an efficient method for teaching young children. This technique can be the bases of an entertaining mechanical game-toy which utilizes a coded rotatable wheel to provide various incentives and rewards which encourage the correct response to questions presented on interchangeable game discs encoded with visual, textural, imbrailled, and accoustical information.

3,745,674
HEARING TESTER
Robert C. Thompson, 812 N. Montford Ave., Baltimore, Md., and Edward S. Cohn, 1909 Fairbank Rd., Baltimore, Md.
Filed Feb. 3, 1972, Ser. No. 223,180
Int. Cl. G09b 7/06; A61b 5/12
U.S. Cl. 35—9 R 9 Claims

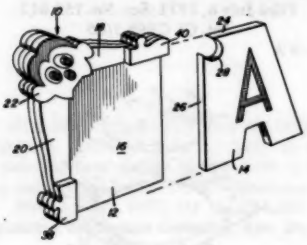
An apparatus to test the ability of a literate human to distinguish and associate among audio and multiple visual stimuli is

taught. The apparatus embodies magnetic audio and magnetic or optic-like projection visual stimuli means with mechanical



and electrical response, and automatic logging and read-out means.

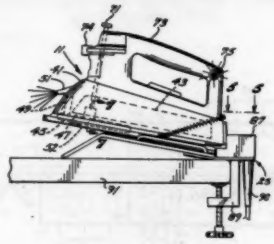
3,745,675
EDUCATIONAL PUZZLE
David J. Jimenez, P. O. Box 3458 Station "A", El Paso, Tex.
Filed Sept. 12, 1972, Ser. No. 288,339
Int. Cl. G09b 1/06
U.S. Cl. 35—73 10 Claims



An educational puzzle for a teaching recognition of letter and number symbols, said puzzle comprising a base with a recessed mounting surface framed on two sides by a raised, three-dimensional figure of a clown, or the like, and inserts shaped in the form of letter or number symbols and adapted to fit on the mounting surface, each insert including an arcuate cut-out or notch on its peripheral edge which completes the face of the clown to produce a smile when the insert is properly oriented on the mounting surface.

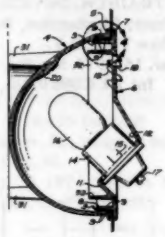
3,745,676
CORDLESS IRON APPARATUS
Joseph K. Dikoff, 4 Privateer St., No. 3, Marina Del Ray, Calif.
Filed Aug. 4, 1972, Ser. No. 278,178
Int. Cl. D06f 75/40, 79/02
U.S. Cl. 38—96 11 Claims

A cordless iron apparatus for ironing a material that deteriorates at a predetermined temperature and including an iron formed with a heat-retention sole plate and including an electrical heating element disposed in heat exchange relationship with the sole plate for heating thereof to a selected temperature higher than the predetermined temperature. The iron further includes an electrical circuit means connected with the heating element and an electrical prong projecting from an electrical insulator. The sole plate is covered by a heat control sheet consisting of short fibers of aromatic polyamides to enable such material to be contacted by the iron when the sole plate is at the selected temperature without burning such material. A stand is provided for receiving the sheet and nesting the iron in a supporting position and includes an electrical insulator formed with a passage aligned with the prong when such iron is in its nested position, such stand further including an electrical terminal disposed in such passage for contact by the prong and electrical circuitry for connection with an elec-



trical source. Thus, the iron may be nested in the stand and the sole plate will be heated to such selected temperature and the iron then removed from the stand and utilized in ironing the material without damage thereto, it being realized that such ironing may be continued until the sole plate cools below the temperature at which such ironing becomes ineffective.

3,745,677
INFLATABLE AND ILLUMINABLE FIGURE
James G. Moran, 122 N. Rose St., Burbank, Calif.
Filed June 15, 1971, Ser. No. 153,370
Int. Cl. G09f 19/00
U.S. Cl. 40—126 B 10 Claims

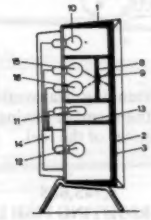


An inflatable and illuminable figure, including a cell formed of complementary members having interengaging margins which sealingly secure the margins of an opening formed in the figure, the cell forming members removably supporting a light source and being relatively rigid and fire resistant to prevent transfer of excessive heat to the inflatable figure whether the figure is inflated or deflated.

3,745,678
MOVEMENT SUGGESTING DISPLAY
Hermanus Hendrikus Josephus Thomassen, Doorn, Netherlands, assignor to Multiscreen N.V., Zwanenburg, Netherlands, a part interest
Filed Sept. 15, 1971, Ser. No. 180,661
Int. Cl. G09f 13/12
U.S. Cl. 40—106.52 8 Claims

Display apparatus suggesting a movement of the displayed objects and having an open front casing of which the front is closed off by a first transparent plate successively coated on the inside surface with a transparent dark layer and a semi-transparent white layer. A second transparent plate spaced at a slight distance behind the first plate bears a picture in the

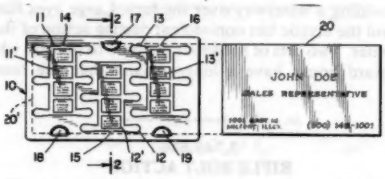
shape of surfaces coated with transparent colored layers and surrounded by an opaque layer serving as a background. The picture consists of a fixed portion which is permanently displayed and at least two portions which are alternately displayed. A plurality of light sources arranged with the casing behind the second plate each illuminate one of the portions and are screened with respect to each other by partitions. The light sources associated with the alternately displayed portions are alternately actuated by a program switch.



3,745,679
WATCHBAND CALENDAR AND BUSINESS CARD HOLDER

Patrick Petrie, 12210 Malone St., Los Angeles, Calif.

Filed Dec. 13, 1971, Ser. No. 207,092
Int. Cl. G09d 3/04
U.S. Cl. 40—107 **1 Claim**



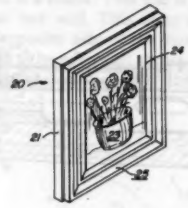
Watchband calendar members are defined by a cut pattern on a single flexible metal sheet in such a manner that they may be successively removed from the sheet and used. The sheet includes holding tabs arranged to slidably receive a business card which overlies the calendar members and helps support them in the plane of the sheet prior to removal.

3,745,680
PICTURE FRAME ASSEMBLY

Emil Faust, Chicago, Ill., assignor to Burwood Products Company, Chicago, Ill.

Filed Feb. 23, 2972, Ser. No. 228,519
Int. Cl. G09f 1/12
U.S. Cl. 40—156 **2 Claims**

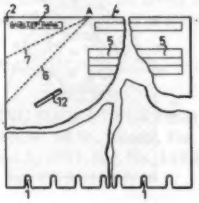
A two-piece picture frame assembly for securing and displaying an image-carrying sheet between inner and outer framing members of the assembly. Tabs of the resilient inner member are removably held in interlocking engagement beneath lugs of the outer member.



3,745,681
FILE CARD, OR THE LIKE

Herbert Costard, Garbsen, Germany, assignor to Edler & Krische, Hanover, Germany

Filed June 3, 1971, Ser. No. 149,720
Claims priority, application Germany, June 4, 1970, P 20 27 397.6
Int. Cl. B42f 21/02
U.S. Cl. 40—360 **8 Claims**



A file card in which certain identifying entries are to appear in filed condition of the card at an angle with regard to the top edge of the filed card, while permitting the entry of all entries on the card along horizontal lines. To this end the file card has a foldable corner portion with a first folding line having one point in common with the said top edge and extending at an angle thereto, while a second folding line longer than said first folding line has approximately the same point in common with said upper edge as said first folding line whereby said foldable corner portion has one section foldable in one direction about said second folding line in one direction toward the non-foldable part of the file card and has a second section foldable about said first folding line in the opposite direction.

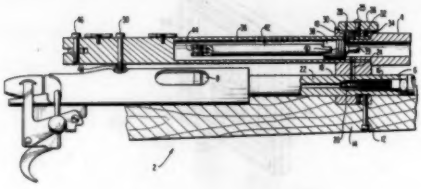
3,745,682
GUN FOR PROPELLING A DRUG OR MEDICINE PROJECTILE

Robert B. Waldeisen, Hillsgrove, Pa., assignor to Pneu-Dart, Inc., Williamsport, Pa.

Filed Sept. 28, 1971, Ser. No. 184,402
Int. Cl. F41c 7/00
U.S. Cl. 42—1 R **5 Claims**

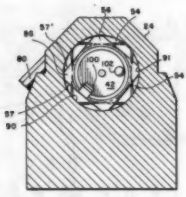
A gun assembly for firing projectiles or darts includes a projectile barrel connected to a modified conventional small bored rifle. A gas transfer block connects the barrel wth the rifle to convey exploded expanding gas as a source of propulsion. A restrictive orifice is valved in the transfer block and

pressure relieving ports are provided to vent exploding gas and thereby control the velocity of the projectile. A bolt actuator



mechanism on the projectile barrel provides an over center locking rod and O-ring sealed bolt for sealingly inserting a projectile into the barrel.

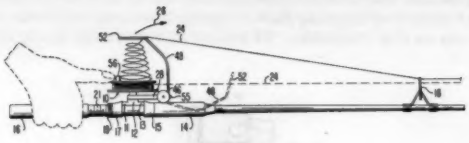
3,745,683
RIFLE BOLT ACTION
Homer E. Koon, Jr., Denton, Tex., assignor to Firearm Development, Inc., Denton, Tex.
Filed Apr. 7, 1971, Ser. No. 132,141
Int. Cl. F41c *11/06*
U.S. Cl. 42—16 **10 Claims**



A rifle bolt action comprising a system of at least four bolt locking lugs adjacent the front thereof and corresponding receiver locking lugs. A camming arrangement is employed to cock a firing pin carried by the bolt when the bolt is rotated. A minimum angle of rotation is used to cock the firing pin while attaining a maximum locking strength for this angle of rotation due to the use of the locking lug arrangement. The forward surfaces of the receiver locking lugs are chamfered to permit slight rearward movement of the bolt over the last few degrees of rotation to unlock same, so that the spent cartridge can be broken loose.

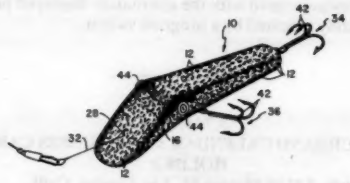
3,745,684
FISHING APPARATUS
Carl T. Larson, One Kearing St., San Francisco, Calif.
Continuation-in-part of Ser. No. 779,690, Nov. 29, 1968, abandoned. This application Jan. 5, 1970, Ser. No. 665
Int. Cl. A01k *89/00*, *89/04*
U.S. Cl. 43—24 **15 Claims**

Fishing apparatus for casting and reeling in a fishing line wherein a reel having means for mounting the same on a rod is provided with structure permitting a fishing line to be removed from the reel in twirls or convolutions during a cast and as the reel remains stationary on the rod. The convolutions move substantially upwardly from the reel to a location spaced above the latter, following which the line moves forwardly in the intended direction of cast. After the cast, the structure permits the line to be directed head-on to the reel to permit reeling in of the line. The reel is mounted with its central axis passing through the rod so that control of the convolutions during a cast can be achieved. The structure in-



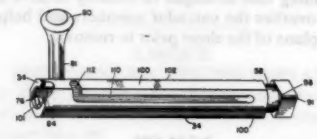
cludes a member extending transversely of the forward direction of the cast, the member having a transverse dimension related to the diameter of the reel.

3,745,685
SELF-RIGHTING FISH LURE
Gerald M. Swarthout, 620 Darwin, Pinckney, Mich.
Filed Aug. 16, 1971, Ser. No. 172,151
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.34 **3 Claims**



A fish lure having a longitudinal downwardly concave bottom surface and a convex upper surface that is high in the central portion and converges at either end of the lure toward the bottom surface. A trough extends along the longitudinal center line of lure from the front edge to the central portion of lure providing a waterway over the lure. Large eyes function to control the erratic but non-violent darting action of the lure in the water. Two sets of hooks are secured to the lure wherein the forward hooks have a longer shank than the rearward hooks.

3,745,686
RIFLE BOLT ACTION
Homer E. Koon, Jr., Gainsville, Tex., assignor to Firearm Development, Inc., Denton, Tex.
Filed Apr. 7, 1971, Ser. No. 132,110
Int. Cl. F41c *11/00*
U.S. Cl. 42—16 **10 Claims**



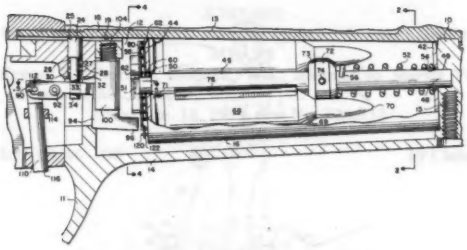
A rifle bolt action that employs a multi-sided bolt for being carried within a cylindrical channel of a receiver. Only a small portion of the surface area of the bolt contacts the channel of the receiver, thus minimizing friction. The multi-sided bolt provides substantial space between the bolt and receiver within which dirt and grit can collect to prevent binding of the bolt within the receiver.

3,745,687

ROTARY MAGAZINE FOR BOLT ACTION RIFLE

Homer E. Koon, Jr., Denton, Tex., assignor to Firearm Development, Inc., Denton, Tex.

Filed Apr. 7, 1971, Ser. No. 132,145
Int. Cl. F41c *13/00, 25/10*
U.S. Cl. 42—19 10 Claims



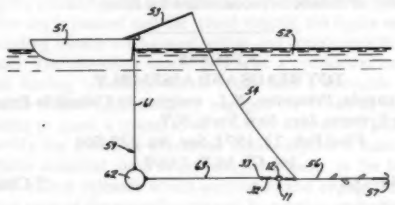
A spring driven rotary magazine for a bolt action rifle, which is actuated responsive to operation of the bolt. A lever system is employed for coupling the bolt and the magazine, and can be manually operated to remove the cartridges without operation of the bolt when the bolt is withdrawn. A cartridge tip protector is employed within the magazine to prevent jamming of the cartridges.

3,745,688

FISHING DEVICE

Winston E. Brownlee, 215 St. Mary's St., Suttons Bay, Mich.

Filed Apr. 19, 1971, Ser. No. 135,208
Int. Cl. A01k *91/04*
U.S. Cl. 43—43.12 10 Claims



A fishing device, in particular, a release device adapted be be connected between a trolling line and either an outrigger or a downrigger for permitting controlled release of the line. The release device includes a resilient plug having a first connecting pin fixedly secured thereto for connection to either the outrigger or the downrigger. A second connecting pin is slidably and frictionally received within one of a plurality of different sized bores formed in the resilient plug, the magnitude of frictional engagement between the second connecting pin and the resilient plug being determined by the size of the selected bore. The second connecting pin is interconnected to the trolling line and is slidably releasable from the resilient plug in response to a predetermined drag imposed on the line.

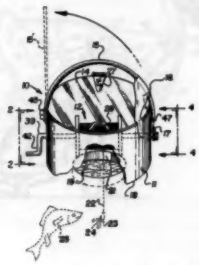
3,745,689

ICE FISHING BOX

Orris Williams, Rt. 1, Friendship, Wis.

Filed Nov. 15, 1971, Ser. No. 198,713
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 6 Claims

An ice fishing box has been provided in which a spring signal strip can be released from the box in response to the turning movement of a fish line reel rod that has a vertical retaining plate for the end of the spring strip to hold it on the pin projection on the side wall of the box. At the opposite end of the fish reel rod is a crank. This rod is journaled in the opposite sides of the box wall. This same spring signal strip is anchored to the opposite side of the box and by means of a latch plate adapted to be extended across the end of the spring strip on the latched end of the spring strip with a pin projec-



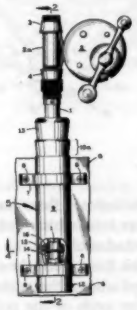
tion, can be held in place in the form of a bail by which the box can be carried from one location to another. A transparent cover is provided on the top of the box formed of glass or plastic hingedly connected to the rear side and has a handle on the front side. The reel on being turned by the crank, can bring the fish up to the opening and under the cover so that upon lifting the cover the fish can be taken from the ice box away from the ice hole for the purpose of freeing the fish from the line hook.

3,745,690

SELF SECURING SOCKET FOR FISHING ROD

Edgar R. Lewis, 6690 S.W. 98 St., Miami, Fla.

Filed June 3, 1971, Ser. No. 149,616
Int. Cl. A01k *97/10*
U.S. Cl. 43—21.2 1 Claim



A tubular socket member adapted to be secured to an inside surface of a boat for receiving and holding upright a fishing rod by the handle end thereof including a conical wedge member slidably retained on the rod for manual wedging engagement within the socket when the slotted handle end of the rod is selectively engaged in one of four rotated positions on a transverse pin secured in the lower end portion of the socket including a bumper on the lower portion of the handle of the rod for disengaging the conical wedge and the rod from the socket when the rod is manually moved upward a predetermined distance.

3,745,691

HARMLESS FIREWORK

Samuel E. Brown, Jr., Danville, Va., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,683
Int. Cl. F41f *27/00*; F42d *7/00*
U.S. Cl. 42—55 **1 Claim**

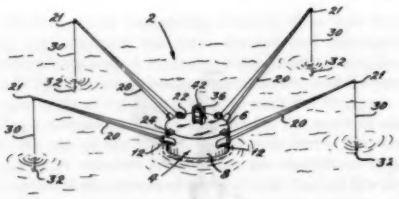
An elongated hollow tube or cylinder open at one end has a disc with a small central opening sealing off the other end. A second like disc with like opening is disposed in the tube intermediate the ends but much closer to the diaphram bearing end to the open end. The discs are parallel. Lighter fluid is squirted into the space between the discs. The fluid is ignited whereby a harmless loud noise is produced.

3,745,692

FISHING DEVICE

Sidney McGee, 414 Hanly, Mexico, Mo.

Filed May 13, 1971, Ser. No. 143,090
Int. Cl. A01k *93/00*, *97/10*
U.S. Cl. 43—17.5 **6 Claims**



A fishing device includes a float having a circular sidewall provided with sockets into which fishing poles are inserted. The sockets are oriented such that the poles project outwardly and upwardly from the float, and when the float is in the water the poles are disposed above the water surface. Fishing lines depend from the outer ends of the poles and enter the water where they are attached to hooks. The float carries a light for marking the location of the fishing device in darkness.

ERRATA

For Classes 43—24, 43—42, 43—43, 43—17, and 43—21 see:
Patents Nos. 3,745,684, 3,745,685, 3,745,688 thru 3,745,690

3,745,693

SWING-AROUND BUBBLE-MAKING TOY

John Edward La Fata, 5000 Marlin Way, Oxnard, Calif., and John D. Cuccio, 808 N. Signal St., Ojai, Calif., assignors to John Edward La Fata, Oxnard and John D. Cuccio, Ojai, Calif., part interest to each

Filed Sept. 25, 1972, Ser. No. 291,958
Int. Cl. A63h *33/28*
U.S. Cl. 46—7 **15 Claims**

A toy has a reservoir of bubble-producing liquid that communicates through one or more small exit holes with a hollow stem whose side wall is formed with multiple ports.

As the toy is swung through the air by a line attached to the reservoir, centrifugal force presses droplets or charges of bubble-producing liquid through the exit holes onto the interior surface of the hollow stem where the liquid spreads over the ports to form films. Grasping the toy and holding it generally upright while moving it back and forth within a narrow range will similarly permit gravitational force to feed droplets to the ports.

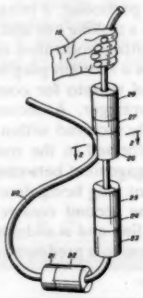
Streams of air slipping through the ports encounter the films and convert them into a trail of bubbles. Successive droplets of bubble-producing liquid are constantly supplied under external force to restore or reconstitute the films.

3,745,694

TOY BEADS AND ASSEMBLY

Jorma Vennola, Princeton, N.J., assignor to Columbia Broadcasting Systems, Inc., New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,804
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 **7 Claims**



A toy or amusement device which is an improvement on the type of toy that is based on the concept of a string of beads. An elongated flexible and compressible support rod or string is provided. A plurality of beads are adapted to be slidably strung on the rod, the number of beads preferably being small enough to leave substantial uncovered slack on the rod. The beads have external grooves dimensioned to receive and

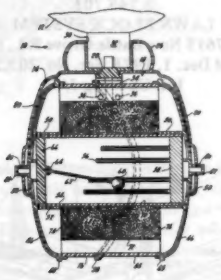
squeeze-hold portions of the rod slack. In a preferred embodiment of the invention, the rod is cylindrical in shape and is formed of a soft vinyl material. The width of the grooves is smaller than the diameter of the rod such that the rod can be forced into the grooves and secured therein. In this manner, a large variety of stringing and looping combinations can be achieved, to the amusement of a child experimenting with the toy.

3,745,695

MOVABLE SOUNDING TOY WITH SOUND AMPLIFYING MEANS

Ernest L. Thornell, Horicon, Wis., assignor to Marlin Toy Products, Inc., Horican, Wis.

Filed Feb. 16, 1972, Ser. No. 226,832
Int. Cl. A63h *5/00*
U.S. Cl. 46—98 **19 Claims**



A device such as a movable sounding toy fabricated of molded plastic comprises an animal-like figure pivotably mounted on a supporting yoke and a hollow wheel rotatably mounted on a yoke. A cam follower attached to the figure engages a circumferential sinusoidal cam track on the wheel and, as the toy is pushed and the wheel rotates, the figure oscillates. Sounding means are located within and rotate with the hollow wheel. The sounding means comprise a cylindrical cardboard tube having vibratory metal reeds and a movable clapper therein which intermittently engages the reeds as the wheel rotates to cause a sound to be emitted. Means are provided to amplify the sound so produced and comprise a mass of rigid cellular material, such as polyethylene foam, in the form of a thick-walled cylinder which surrounds and engages the cylindrical tube of the sounding means. In another embodiment the device is a ball formed by a spherical mass of cellular material in which the sounding means are embedded.

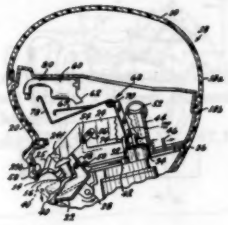
3,745,696

DOLL HAVING MEANS FOR CHANGING FACIAL EXPRESSION UPON TURNING OF HEAD

Jurgis Sapkus, Manhattan Beach; J. Stephen Lewis, Pacific Palisades; Ronald R. Leidtke, Redondo Beach, and Armando P. Villasana, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Mar. 1, 1972, Ser. No. 230,594
Int. Cl. A63h *11/00, 3/24*
U.S. Cl. 46—135 R **3 Claims**

A doll which can be made to smile or to pout and cry when its head is turned to the left or right, comprising an elastic hollow head member and mechanisms for deforming it when the head is turned. A rigid member braces the center of the upper lip so it does not move. A lower lip member can move the lower lip down or up, while a corner moving member can move the corners of the mouth up or down, all movements being relative to the center of the upper lip to create a smile or pout. The corner moving member is mounted to pull the corners of the mouth back as it moves them up and to push the corners of the mouth forwardly as it moves them down, to make the expression more natural. When the mouth opens in a smile, a hole in the mouth cavity is exposed for the reception



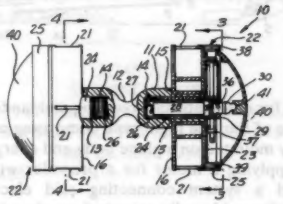
of water that flows into a reservoir in the head, then when the head is moved to a pout position the reservoir is squeezed to supply water to holes in the eyes so that the doll appears to cry.

3,745,697

SELF-ILLUMINATING DIABLO TOP

Wensan Wang, P.O. Box 4082, Berkley, Calif.

Filed Nov. 12, 1971, Ser. No. 198,240
Int. Cl. A63h *33/26*
U.S. Cl. 46—228 **5 Claims**



A self-illuminated diablo top having the illuminated end portions completely detachable as a unit including the battery, bulb, and switch for completing the contact between the battery and bulb when the diablo is rotated at a sufficient speed. The remaining portions of the diablo can be used as, for instance, in the daytime with the illuminated portions detached.

3,745,698

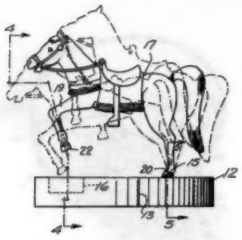
MAGNET OPERATED TOY

Farris B. Davidson, 1641 Trillium Ct., Cincinnati, Ohio

Filed Apr. 28, 1972, Ser. No. 248,403
Int. Cl. A63h *33/26*
U.S. Cl. 46—236 **10 Claims**

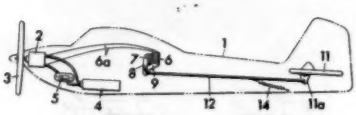
A toy consisting of a base with an aperture across which is tightly stretched a string or wire. A simulated animal has notches in its rear hooves supportingly engaged in the string or wire. The front hooves of the animal consist of permanent magnets and the base has mounted thereon subjacent said

front hooves a permanent magnet of a polarity which opposes the polarity of the magnets forming the front hooves of the simulated animal. Thus, when the animal is initially pivoted on



the stretched string or wire and then released, the opposing magnets produce a spring bouncing effect which causes the simulated animal to rock or oscillate.

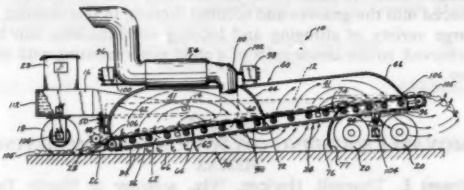
3,745,699
DEVICE FOR AUTOMATICALLY LOWERING AND LANDING AN ELECTRIC MODEL PLANE
Kenichi Mabuchi, Katsushika-ku, Tokyo, Japan, assignor to Mabuchi Motor Co., Ltd., Tokyo, Japan
Filed July 27, 1972, Ser. No. 275,772
Claims priority, application Japan, Oct. 25, 1971, 46/97941
Int. Cl. A63h 27/00
U.S. Cl. 46—243 AV **4 Claims**



A device for automatically lowering and landing an electric model plane of the free flight type comprising an electromagnet securely mounted on a plane body and energized by a battery for supplying a motor for a propeller with an electric power; and a system connecting said electromagnet to horizontal planes hingedly mounted on the plane body and which includes a magnetic member rotatably held by said electromagnet and a tensile means fixed to the plane body. Said magnetic member is adapted to be attracted by said electromagnet against an action of the tensile means while the magnet is sufficiently energized by the battery thereby to maintain said horizontal tail planes in a horizontal flight position and said tensile means acts on the tail planes to shift the same into a slantingly raised position when the attracting force of said electromagnet is overcome by the action of said tensile means by exhaustion of the power thereby lowering and landing the plane automatically.

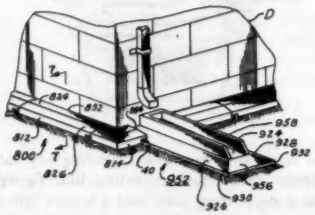
3,745,700
SOIL DRIER
LeRoy W. Hahn, 4103 1st St., Des Moines, Iowa
Filed June 16, 1971, Ser. No. 153,699
Int. Cl. A01b 77/00
U.S. Cl. 47—1.42 **10 Claims**

A machine having a continuous conveyer with a scoop at its forward end and a jet engine supplies hot air at 600° F. and 600 miles per hour to the conveyer. The hot air from the engine is directed back and forth through the dirt being conveyed and the conveyer approximately five times. Hydraulic motors and power cylinders are driven by the jet engine for



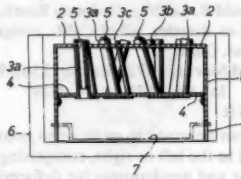
moving the machine and raising and lowering the conveyer and scoop. A rototiller may be placed in proximity of the scoop for pulverizing the soil.

3,745,701
LAWN BLOCK SYSTEM
John R. Marvin, 7615 New Battle Grove Rd., Baltimore, Md.
Filed Dec. 1, 1971, Ser. No. 203,596
Int. Cl. A01g 1/08
U.S. Cl. 47—33 **6 Claims**



A lawn defining system of co-acting slabs having upper surfaces specially angled to provide safe, efficient paths for rotary mowers, and having special stepped overlapping joints between slabs gapped beneath the overlap to allow relative motion and to prevent capillary action from drawing ground water into the joints; embodiments are provided for fence underlayment and for installation around building foundations.

3,745,702
FLOWER HOLDING BASE FOR FLOWER ARRANGEMENT
Kohei Ogawa, 220-7, Miwa-machi, Machida-shi, Tokyo, Japan
Filed Oct. 13, 1971, Ser. No. 188,975
Int. Cl. A47g 7/07
U.S. Cl. 47—41.13 **2 Claims**



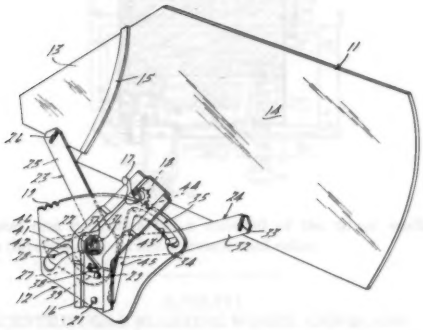
A flower holding base for flower arrangement provided with a plurality of flower inserting cylinders having different diameters and upper ends of which are opened and being disposed in a predetermined pattern and cylinders are slightly different from each other with respect to direction thereof.

3,745,703

VEHICLE WINDOW REGULATOR MECHANISM

Reid E. Francis, Dearborn, Mich., and Anthony T. Marcuzzi, Windsor, Ontario, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 8, 1971, Ser. No. 196,376
Int. Cl. E05f 5/12
U.S. Cl. 49—103 5 Claims



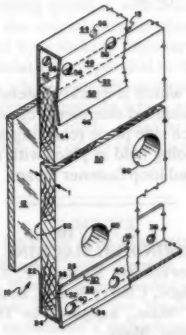
A vehicle window system for raising and lowering in a window opening in a vehicle body structure a window panel vertically divided into coplanar ventilation and visibility sections. The system includes a window regulator mechanism comprising a first regulator arm coupled to the ventilation system and a second regulator arm coupled to the visibility section. The regulator arms also are coupled to the window regulator mechanism gear sector through respective pairs of followers and cam slots. The respective followers and cam slots are programmed so that upon rotation of the gear sector in window opening direction the ventilation section is first lowered to a predetermined position before the visibility section starts to open and upon rotation of the gear sector in window closing direction the visibility section reaches a fully raised position before the ventilation section starts to rise.

3,745,704

STORM SHUTTER INSTALLATION

James B. Covington, 3926 Panama, Corpus Christi, Tex.

Filed Dec. 6, 1971, Ser. No. 204,874
Int. Cl. E06b 9/02
U.S. Cl. 49—57 5 Claims



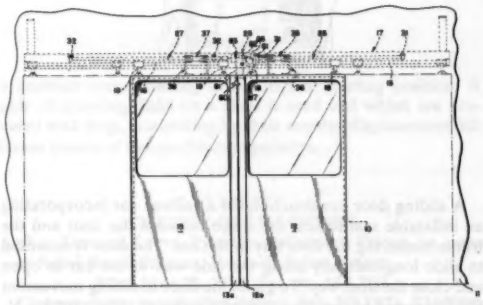
There is disclosed a storm shutter installation for a building window wherein channels are affixed to the building adjacent the upper and lower parts of the window. A panel is inserted into the channels by placing the upper edge thereof in the upper channel, elevating the panel until the lower panel edge clears the lower channel, swinging the lower panel edge into alignment with the lower channel and lowering the panel into the lower channel. The lower channel is constructed so that the opening thereof may be positioned on either a horizontal sill or on a slanted sill and aligned with the upper channel. Means are provided for tightly grasping the panel in the lower channel.

3,745,705

INTEGRATED LINEAR DOOR OPERATOR

Redreddy Sukumar Reddy, Chicago, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Apr. 24, 1972, Ser. No. 247,177
Int. Cl. E05f 15/14
U.S. Cl. 49—139 14 Claims



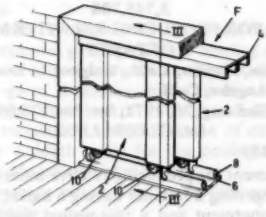
A door operator for driving a track guided door through opening and closing cycles, including a rotating shaft and drive member movable therealong in response to rotation wherein the drive member is resiliently coupled to a door. A locking mechanism is provided for locking the door in closed position and an emergency device enables opening of the door when power is not available.

3,745,706

SLIDING DOOR

Boris Stermac, 147 Underhill Dr., Don Mills, Ontario, Canada

Filed Sept. 18, 1972, Ser. No. 289,815
Int. Cl. E05d 13/02
U.S. Cl. 49—425 11 Claims



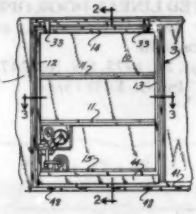
A door panel slidable in a door frame with a flexible guide for the upper end of the panel at the top of the frame and a track at bottom of the frame on which said panel is slidable on guides. The panel is maintained in engagement with said track by a retainer projecting from the lower end of the panel and formed to effect snap-on and snap-off engagement and disengagement with said track.

3,745,707

SLIDING DOOR CONSTRUCTION UTILIZING AN INFLATABLE SEAL

Theodore Z. Herr, 672 Hyacinth Pl., Highland Park, Ill.

Filed Aug. 18, 1971, Ser. No. 172,811
Int. Cl. E05d *13/04*
U.S. Cl. 49—449 **15 Claims**



A sliding door construction for a railway car incorporating an inflatable seal to seal the space between the door and the frame bordering the doorway in the car. The door is mounted to slide longitudinally along the side wall of the car to open and close the doorway. To guide the door in sliding movement the lower end of the door carries a series of rollers having V-shaped peripheral grooves that ride on a V-shaped rail, while the upper end of the door is provided with a series of anti-friction elements that ride against the door frame. As the door is spaced laterally outward so that it can slide freely with respect to the car, an inflatable seal is associated with the peripheral edge of the door and when inflated serves to seal the space between the door and the frame. The mechanism for inflating and deflating the seal is associated with the locking device for the door and is arranged to supply hydraulic fluid to the seal to inflate the same when the locking device is engaged and to withdraw the fluid to deflate the seal when the locking mechanism is disengaged.

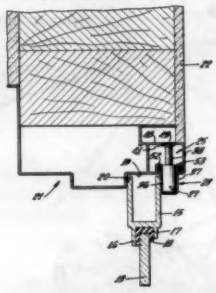
3,745,708

FASTENER FOR PRODUCING RELATIVE MOVEMENT OF PARTS

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Filed Aug. 26, 1971, Ser. No. 175,055
Int. Cl. E05d *13/00*
U.S. Cl. 49—454 **14 Claims**

An arrangement for producing relative movement between two parts comprising a fastener having a barrel, at one end of which is an abutment and a thin-walled portion to extend through an opening in a movable member and bent outwardly to form a flange to cooperate with the abutment to secure the barrel to the movable member, a screw extending through a threaded opening in the opposite end of the barrel, the screw at its outer end having an extension of smaller diameter providing a radial shoulder and a relatively thin wall so that the extension can pass through an opening in an attaching member, with the thin wall being bent outwardly to form a flange to cooperate with the shoulder of the screw to hold the screw rotatably to the attaching member, the attaching member, in turn, having a shoulder and a tubular section with a thin wall, whereby the tubular section can fit through an opening in a stationary member with the abutment of the attaching member at one end of the opening and the thin wall of the attaching member being bent outwardly to form a flange to cooperate with the abutment of the attaching member in holding the attaching member to the stationary member.

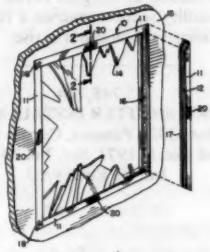


3,745,709

PULL-OUT WINDOW FRAME

Joseph Perina, Huntington, N.Y., assignor to American Velcro, Inc., Manchester, N.Y.

Filed Apr. 5, 1971, Ser. No. 130,953
Int. Cl. E05c *21/02*
U.S. Cl. 49—465 **5 Claims**



A window frame which is quickly assembled and disassembled comprising channeled side pieces connected at their ends to form a frame, each side piece receiving an edge portion of a window pane and being held in place with respect to adjacent structure by hook and loop fastener means.

3,745,710

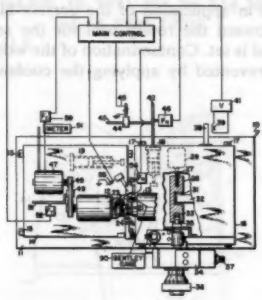
GRINDING MACHINE

Robert S. Hahn, Northboro; Richard P. Lindsay, Marlboro; Edward G. Robillard, Cherry Valley, and David H. Youden, Worcester, all of Mass., assignors to The Heald Machine Company, Worcester, Mass.

Continuation of Ser. No. 717,853, April 1, 1968, abandoned.
This application Feb. 1, 1971, Ser. No. 111,608
Int. Cl. B24b *53/00*
U.S. Cl. 51—5 **10 Claims**

This invention relates to a grinding machine and, more par-

ticularly, to a system for preventing thermal damage in abrasive machining and finishing by measuring abrasive wheel



dullness and providing for a renewal of the wheel surface when the dullness reaches a preselected value.

3,745,711

CENTRIFUGAL BLASTING WHEEL AND BLADE LATCHING MEANS

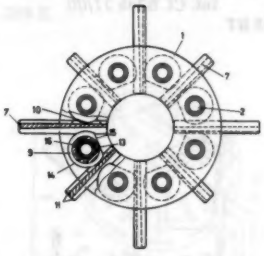
Hans Paul Haberlin, Schaffhausen, Switzerland, assignor to The Wheelabrator Corporation, Mishawaka, Ind.

Filed Mar. 19, 1971, Ser. No. 126,039

Claims priority, application Switzerland, May 6, 1970, 6792/70

Int. Cl. B24c *5/06*

U.S. Cl. 51—9 **7 Claims**



A centrifugal blasting wheel in which the blades extending crosswise between the spaced parallel plates of the wheel are locked in the wheel by a locking member mounted for rotational movement about an axis parallel to the axis of the wheel and having a lobe which extends alongside the face of the plate including an arcuate portion which extends into a recess in the edge portion of the blade, when in one position of adjustment, and which is free of the blade, when in another position of adjustment.

3,745,712

FEEDING DEVICE FOR MACHINE TOOLS

Vaclav Hajsman, Plzen, Czechoslovakia, assignor to Skoda, norodnia podnik, Plzen, Czechoslovakia

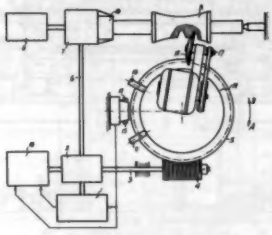
Filed Dec. 21, 1971, Ser. No. 210,360

Claims priority, application Czechoslovakia, Dec. 22, 1970, 8671/70

Int. Cl. B24b *5/04*

U.S. Cl. 51—33 W **4 Claims**

A mechanical storage device is attached to a feeding device for machine tools, particularly for grinding machines of globoid worms. The device enables preselection of machining operations which are to be repeatedly performed and where the tool is supported to be returned after a working phase into



a position corresponding to its original starting position. A pair of coupling disks on a shaft is used and which are provided with dogs, controlling by their angular displacement different phases of the machining operation.

3,745,713

CUTTING-OFF MACHINES

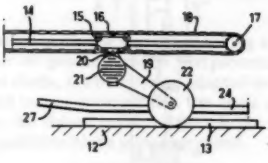
Arthur Fernand Fabre, Pyrenees-Orientales, France, assignor to Nobel-Bozel, Puteaux, Hauts-de-Seine, France

Filed June 23, 1971, Ser. No. 155,703

Claims priority, application France, Feb. 22, 1971, 7105990

Int. Cl. B24b *7/00, 9/00*

U.S. Cl. 51—34 C **4 Claims**



The invention deals with an improved machine for cutting off metal sheets.

The improvement consists in the fact that a carriage, movable along a horizontal guiding rail and bearing an arm at the extremity of which is mounted a cutting-off disc rotated at high speed, is given simultaneously a continuous to-and-fro movement in the direction of cutting and an intermittent movement of translation in the direction of cutting brought into action by a depth guide for the cutting-off wheel, by means of a suitable transmission system.

This improvement renders automatic the opration of the cutting-off machine.

3,745,714

TIPPING DEVICE FOR WORK HOLDER

James W. Weatherell, Olean, N.Y., assignor to Clair Mfg. Co., Inc., Olean, N.Y.

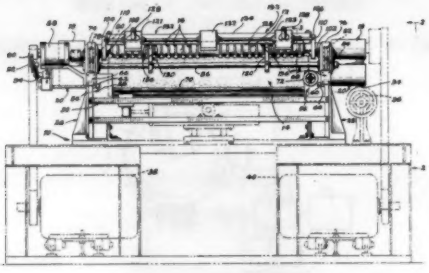
Filed Oct. 14, 1971, Ser. No. 189,246

Int. Cl. B24b *5/16, 47/08*

U.S. Cl. 51—85 R **10 Claims**

A workpiece processing machine having a work holder mounted to pass curved bowl portions of workpieces in and

out between a pair of processing rolls is provided with a device for tipping the work holder each time the workpieces are removed from between the processing rolls, whereby the tip



ends of the curved bowl portions are forced into positive engagement with one of the rolls to insure uniform processing of the surface of the curved bowl portions.

3,745,715

HONING APPARATUS

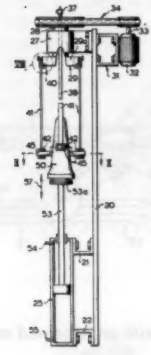
Karl Borcherding, D-3052 Bad Nenndorf, Germany, assignor to Herman Heye Obernkirchen Allee

Division of Ser. No. 50,096, June 26, 1970, Pat. No. 3,678,630. This application May 9, 1972, Ser. No. 251,750

Claims priority, application Germany, July 2, 1969, P 19 33 575.2

Int. Cl. B24b *33/04, 5/36, 5/14*

U.S. Cl. 51—92 R **12 Claims**



A honing apparatus in which honing tools and a workpiece slide on each other in a composite rotary and oscillatory movement, has honing tools resiliently biased into engagement with the workpiece whereby a very smooth surface is quickly obtained.

3,745,716

SECTIONERS

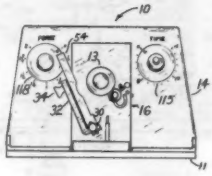
Roger Scott Turner, 620 Carpent Lane, Philadelphia, Pa.

Filed Mar. 30, 1971, Ser. No. 129,464

Int. Cl. B24b *19/02, 41/06*

U.S. Cl. 51—96 **13 Claims**

A machine for sectioning and measuring thin layered materials such as are used in semiconductors in which: the workpiece is positioned in a mechanical chuck which supports and protects the workpiece during the operations of sectioning, cleaning, staining, transfer and measurement, the machine includes electromagnetic elements for biasing the workpiece into engagement with a rotary abrasive tool of precisely known radius and the force of the electromagnet is manually adjusted by a rheostat having a pointer dial and an index of section width marks so referenced to the dial and the rheostat that setting the pointer dial to any width mark of the index results in application of the correct bias force of the workpiece toward the rotary tool for the section width to which the dial is set. Contamination of the work area by spent coolant is prevented by applying the coolant to the rotary



abrasive tool at a controlled rate by a positive displacement pump, spreading it evenly over the surface of the tool and removing it with a resilient blade before it exceeds a film thickness at which adhesive and cohesive forces are greater than the centrifugal forces acting upon it. Damage to work pieces is prevented by an automatic time delay relay which delays the application of the selected bias force for several seconds after the start of each sectioning operation.

3,745,717

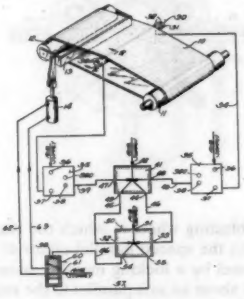
FLUIDIC CIRCUIT CONTROL FOR CENTERING SANDING BELT ON A BELT SANDER

Charles E. Robinson, 208 Gardner Ave., Burlington, Wis.

Filed Feb. 17, 1971, Ser. No. 115,960

Int. Cl. B24b *21/00*

U.S. Cl. 51—135 BT **10 Claims**



An abrasive belt is supported on a pair of rolls, at least one of which is steerable to control lateral travel of the belt. A control bar over which the underside of the belt travels is provided with one or more sensing apertures connected to fluidic circuitry which actuates the steering mechanism to control the lateral position of the belt and to cause the belt to oscillate laterally. The circutry is such that the sensing of belt position is accomplished entirely by air emerging from control apertures without entering another aperture.

ERRATUM

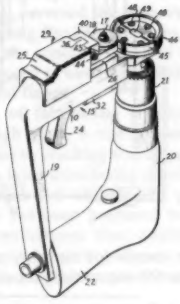
For Class 51—236 see:
Patent No. 3,746,523

3,745,718

APPARATUS FOR POLISHING A SEAMING ROLL

Roy M. Peebles, c/o Sheldon Little Company, 1228 Zonolite Road, N.E., Decatur, Ga.

Filed Feb. 10, 1971, Ser. No. 114,200
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 S 14 Claims



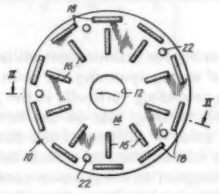
An apparatus for polishing seaming rolls of an automatic can closing machine without removing the seaming rolls from the can closing machine, wherein the seaming rolls are engaged and rotated by an expandable chuck, and an abrasive material is spring urged into the peripheral seaming groove of the seaming rolls.

3,745,719

GRINDING WHEEL FOR FLOOR GRINDING MACHINE

Fred Oswald, 65 Channel Drive, Port Washington, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,448
Int. Cl. B24d *7/06*
U.S. Cl. 51—209 R 12 Claims



A flat steel wheel is provided for a floor grinding machine. The wheel which is provided with a group of regularly distributed diamond matrices is further provided with a group of regularly distributed tungsten carbide buttons, which protrude from the wheel to a lesser extent than the diamond matrices and, provide for evening the wear of the matrices should one matrix tend to wear more rapidly than another. Instead of the flat wheel, a spider can be used in which abrasive elements are replaceably mounted. Carbide buttons are located on the spider to prevent wear and destruction of the same.

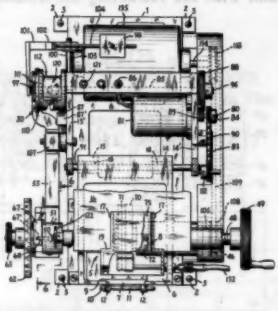
3,745,720

LENS EDGE-GRINDING, FINISHING AND BEVELING MACHINE

Milton B. Savage, 1780 E. 9th St., Brooklyn, N.Y.

Filed Sept. 2, 1970, Ser. No. 69,080
Int. Cl. B24b *9/14*
U.S. Cl. 51—101 LG 37 Claims

A compact machine is provided for grinding, finishing and beveling the edges of lenses to a pattern size and edge shape. A sizing cam permits control of size to any desired fine adjustment, with complete accuracy. The grinding of a lens blank to a selected pattern is controlled by a master cam which guides a work carriage both for grinding the lens to pattern and size, and for finishing and beveling the edge to any desired bevel center. The lens grinding operation from start to finish is



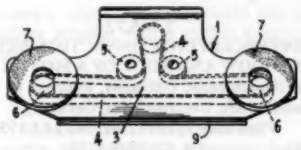
completely automatic, and fully controlled, and the machine automatically comes to a halt when the lens has been shaped and ground to the selected pattern and size.

3,745,721

GUILLOTINE SHARPENER

Patrick Robert Williams, Mount Eliza, Victoria, Australia, assignor to Temtool Pty. Limited, Victoria, Australia

Filed June 28, 1971, Ser. No. 157,383
Int. Cl. B24b *19/00*
U.S. Cl. 51—249 5 Claims



A motor driven guillotine sharpener having a body in which at least a pair of grinding wheels are mounted for rotation about parallel shafts, the body being adapted to lie on the guillotine bed and means ensuring that the angle of the grinding wheels, when the deivce is on the bed, is the required bevel angle of the guillotine blade to be sharpened.

3,745,722

FINISHING METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Filed Sept. 13, 1971, Ser. No. 180,088
Int. Cl. B24b *31/06*
U.S. Cl. 51—314 14 Claims

Workpieces are finished in a vibratory or tumbling finishing apparatus by means of chips containing abrasive grains in an ice matrix. During finishing, a hydrocarbon-based liquid refrigerant chilled below the melting temperature of the ice matrix is circulated through a vibrating admixture of workpieces and chips.

3,745,723

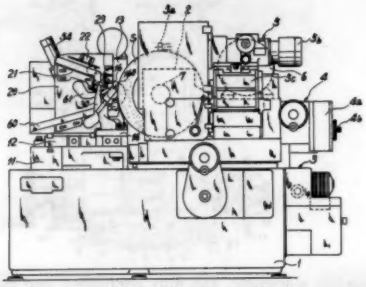
GRINDING MACHINE WITH LOADER AND WORK SUPPORTING SHOES

Makoto Kikuchi, Kariya-shi, Japan, assignor to Toyoda Koki Kabushiki Kaika, Aichi-ken, Japan

Filed May 28, 1971, Ser. No. 147,815
Claims priority, application Japan, May 30, 1970, 45/46542
Int. Cl. B24b *41/06, 51/00*
U.S. Cl. 51—103 WH 16 Claims

In a grinding machine of the type in which a workpiece is rotatably supported on a pair of shoes, one of the shoes is fix-

edly mounted adjacent a grinding wheel, while the other is movably mounted opposite the grinding wheel and downwardly discharges a completed workpiece from a working station when it is moved away from the grinding wheel. In co-operation with the retracting movement of the movable

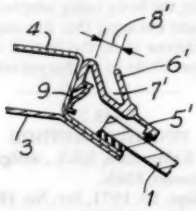


shoe, a loading arm transfers a yet unoperated-on workpiece from a ready station to the working station where a diameter of the workpiece is measured by a movable feeler mounted on a sizing device contacting the workpiece at a position thereon opposite the two points of contact of the shoes.

ERRATUM

For Class 51—145 see:
Patent No. 3,745,728

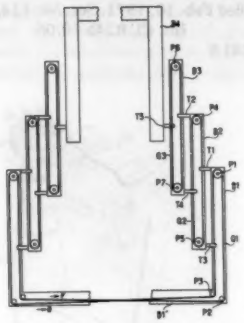
3,745,724
WATER INTERCEPTING CONNECTION BETWEEN THE REAR WINDOW AND ROOF OF A MOTOR VEHICLE
Hans Gotz, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Unterturkeim, Germany
Filed May 7, 1971, Ser. No. 141,195
Int. Cl. B60j *1/18*
U.S. Cl. 52—11 **5 Claims**



The upper edge of the rear window of a motor vehicle is connected to the roof of the vehicle by a connection which provides a lateral water channel having an open top to intercept the flow of water from the roof towards the rear window. The channel may be defined between the roof and a rubber undermolding and decorative outermolding, or the channel may be formed entirely within the outermolding when the window is directly joined to the roof by adhesives.

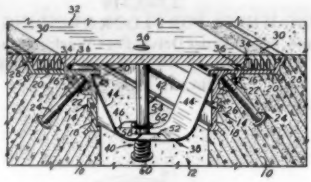
3,745,725
EXTENSIBLE STRUCTURE
Andre Jean Boucaud, Saint-Igny-de-Vers (Rhone), France
Filed Jan. 11, 1971, Ser. No. 105,383
Int. Cl. E04b *7/16*
U.S. Cl. 52—67 **2 Claims**

An extensible structure comprising in combination a plurality of elements adapted to fit into one another and to slide on a guiding device so as to increase or reduce the volume of the structure, each element having one girder, two lateral walls, a framework and a roof supported on said lateral walls



and said girder, means for movably supporting the said elements and means for sequentially moving the said elements.

3,745,726
FLOOR JOINT COVER ASSEMBLY
Wenzel W. Thom, Wichita, Kans., and Architectural Art Mfg., Inc., 02, Wichita, Kans.
Filed Nov. 15, 1971, Ser. No. 198,602
Int. Cl. E04f *15/14*
U.S. Cl. 52—98 **12 Claims**



A cover assembly for a floor joint utilizes the combination of a bowed leaf spring spanning the joint and a coiled compression spring extending vertically in the joint to maintain an essentially stable holding bias on the cover plate of the assembly during relative shifting of the floor members of the joint caused by normal thermal effects on the members. The leaf spring is designed to break upon excessive movement of the floor members such as by earthquakes, thus releasing the cover plate before the latter can be permanently damaged.

3,745,727
SWIMMING POOL, STRUCTURE
Everett R. Chichester, Sr., Cobleskill, N.Y., assignor to H.P.I. Interstate, Ltd., Guilderland, N.Y.
Filed Mar. 22, 1971, Ser. No. 126,645
Int. Cl. E04h *3/16*
U.S. Cl. 52—169 **5 Claims**

Discloses a swimming pool structure disposed in an excavation comprising a plurality of pool panels, joined together in side by side relationship, disposed vertically in the excavation and defining the pool perimeter. The pool panels have a bottom angle or concrete lock and vertical reinforcing guide sleeves on the rear of the pool panels which are interlocked by a horizontal reversed reinforcing angle. Stakes or concrete reinforcing rods are driven into the ground through the bottom angle and guide sleeves. Coping perimeter concrete reinforcing rods are fixed to long legs of L-shaped coping reinforcing rods whose short legs are disposed in the vertical guide sleeves. The lower portion of the pool panels, the bottom angles or concrete locks and the stake or concrete reinforcing rods are imbeded in the concrete pool bottom. The coping

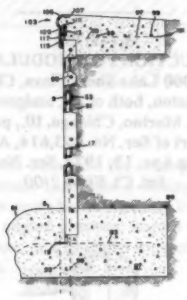
perimeter rods and coping reinforcing rods are imbedded in the concrete coping.

Discloses a fabricated pool panel having front and rear walls, right and left side bolting flanges, bottom angle or concrete lock, vertical reinforcingguide sleeves on the rear wall of the pool panel interlocked by a horizontal reversed reinforcing angle.

Discloses bull nose coping, of integral, one-piece construction, extruded from polyvinyl chloride. The coping has a rounded vertical profile, reversed lip, web, reversed clip, depending leg and depending flange. By means of the reversed clip and depending leg, the coping is disposed on the top of the pool panel, and as disposed is wedgingly held in place by the angled depending leg and flange.

Discloses a process of fabricating a colored pool panel whose surface has a high gloss, is non-porous, has structural flexibility and is resistant to cracking and chipping, comprising the steps of applying a layer consituting a uniform mixture of colored gel-coat, catalyst and thinner to a plate glass mold whose casting surface has been prepared to have a greater degree of polish and smoothness than originally existing, allowing the applied layer to cure and successively applying shock-resistant, flexible, polyester resin alternating with layers of fiberglass glass fiber.

Discloses a process of fabricating a metal-flake pool panel whose surface has a high gloss, is non-porous, has structural flexibility and is resistant to cracking and chipping, comprising the steps of applying a layer constituting a uniform mixture of



clear gel-coat, catalyst and thinner to a plate glass mold whose casting surface has been prepared to have a greater degree of polish and smoothness than originally existing, allowing the applied layer to cure, applying a layer constituting a uniform mixture of clear gel-coat, catalyst and thinner to which colored metal flake has been added in quantity depending upon the color desired in terms of hue, value and intensity, allowing same to cure and successively applying shock-resistant, flexible, polyester resin alternating with layers of glass fiber matting.

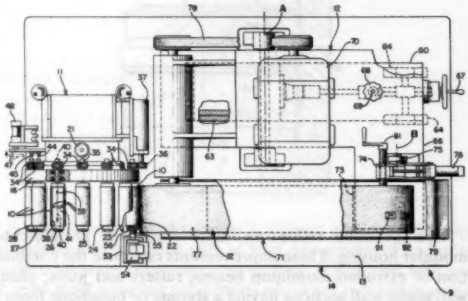
Discloses the method of installing a swimming pool in an excavated hole comprising the steps of disposing 103 vertically in the excavation, to define the pool perimeter, a plurality of pool panels having integral bottom angles or concrete locks on the front sides of the pool panels and vertical reinforcing guide sleeves on the rear sides of the pool panels, joining together the pool panels in side-by-side, watertight relationship, driving into the ground stakes or concrete reinforcing rods through the bottom angles and guide sleeves, disposing in the excavated hole, at the pool panel joints, jack posts operatively connected to jack posts screws, operatively connecting the jack post screws to the pool panel joints and raising the pool panels, forming the pool bottom by pouring cement mixture to a depth sufficient to imbed the lower portions of the pool panels, the bottom angles and stakes, and for strength , removing the jack posts and screws, disposing the short legs of L-shaped coping reinforcing rods in the vertical guide sleeves and disposing the long legs thereof outwardly, backfilling the region of the excavated hole to the rear of the pool panels, joining in fixed relationship coping perimeter concrete reinforcing rods to the long legs of the L-shaped rods, forming the coping by pouring cement mixture to a depth for strength and sufficient to imbed the long legs and coping perimeter reinforcing rods.

3,745,728

GRINDER FOR RUBBER SLEEVES

Karl W. Boehm, Sr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 30, 1971, Ser. No. 185,017
Int. Cl. B24b *21/02, 21/18, 41/04*
U.S. Cl. 51—145 T **24 Claims**



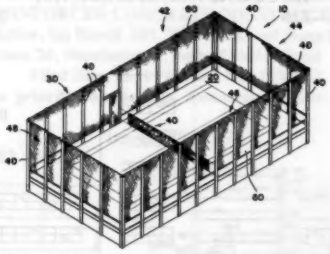
A device for grinding rubber from tubular sleeves mounted on a turret which is rotatable for positioning the sleeves adjacent a belt sander which is also rotatable into and out of sanding or buffing relation with a rubber sleeve positioned closest the sander.

3,745,729

PLATFORM TENNIS COURT

George A. Vaughn, and Richard D. Hargrave, both of Princeton, N.J., assignors to Maark Corporation, Cranbury, N.J.

Filed Dec. 21, 1971, Ser. No. 211,028
Int. Cl. E04h *3/14*
U.S. Cl. 52—222 **14 Claims**



Metal support apparatus including a plurality of structurally interrelated metal members with each metal member being of a predetermined configuration. Also disclosed is a metal (e.g. aluminum) platform tennis court including a plurality of such above-mentioned metal support apparatus on the deck or playing surface of the court, such metal deck or playing surface providing, over the entire area thereof, a more uniform deflection in response to the weight or force of a running player than a wooden playing surface or deck of a wooden platform tennis court. Such metal platform tennis court also including means provided on the screen vertical support members for tensioning the screen which, unlike the prior art, is not bolted through the deck of the platform tennis court thereby permitting the screen tension to be adjusted by one

operator residing on the deck and also permitting the screen to remain in a tensioned condition or fully secured condition during disassembly and transport thus precluding screen tangling or fouling.

3,745,730

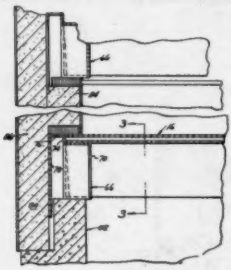
PREFABRICATED MODULAR HOUSING

Robert W. Layne, 25106 W. 8 Mile Rd., Southfield, Mich.

Filed Nov. 10, 1969, Ser. No. 875,152

Int. Cl. E04b *1/343, 1/38, 1/62*

U.S. Cl. 52—236 **7 Claims**



This invention relates to improvements in prefabricated modular housing. These improvements comprise the combination of extruded aluminum beams, rafters and joists; plastic wall studs; wall sections having a styrene or butadiene foam in intermediate sections, plastic or butadiene thin solid sheets for interior and exterior wall surfaces, flexible plastic wiring comprising copper laminated on plastic inserted between the interior wall surface plastic and the foam; aluminum sandwich structural load carrying members on the perimeter of the wall sections; fluid conduits running in interior apertures of the wall studs; and the combination of these features being fabricated into modular units where each unit consists of several rooms of the resultant structure.

3,745,731

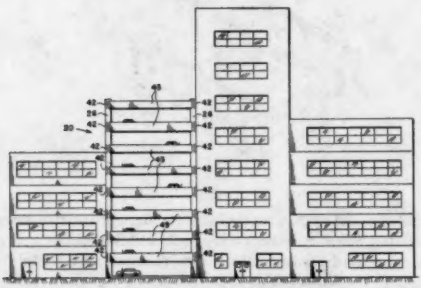
INTERLOCKING BUILDING CONSTRUCTION

Merle A. Simpson, 2407 Enfield, Austin, and Albert S. Heptig, 7000 Freehaven Road, Fort Worth, both of Tex.

Filed Jan. 27, 1971, Ser. No. 110,073

Int. Cl. E04h *1/00*; **E04b** *1/02, 1/54*

U.S. Cl. 52—236 **26 Claims**



A method for constructing a building from a plurality of building elements comprising elongated column members with spaced rectangular notches cut therein, elongated spandrel members having spaced notched portions for interlocking with the notches on the column members and having a horizontal support surface for mounting and supporting floor members thereon. The columns and spandrel members interlock to form a rigid multi-story structure which enables the building to be constructed in sections.

3,745,732

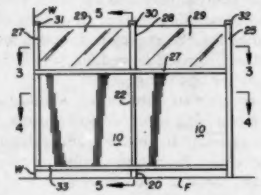
DEMOUNTABLE PARTITION SYSTEM

Harry W. Pritchard, Youngstown, Ohio, and Myron Furman, Pittsford, N.Y., assignors to Superior Industries Inc., Youngstown, Ohio

Filed Aug. 5, 1971, Ser. No. 169,409

Int. Cl. E04b *2/74*

U.S. Cl. 52—239 **5 Claims**



A demountable partition system consists of metal shapes such as aluminum extrusions and wall board panels forming closed and open base rail height and cornice height and ceiling height partitions wherein the wall board panels are supported and retained by the metal shapes so as to be held in spaced relation with their edges enclosed in attractively configured trim. Certain of the metal shapes employed as trim incorporate glazing grooves simplifying glass installation and others include door stops forming door frames and the like.

3,745,733

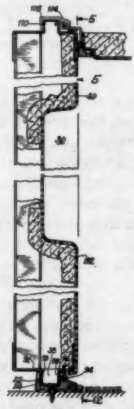
PANEL CONSTRUCTION FOR MODULAR BATHROOMS

Robert L. Litvin, 1000 Lake Shore Plaza, Chicago, and Giorgio L. Spadaro, Evanston, both of Ill., assignors to Robert L. Litvin and Louisa L. Marino, Chicago, Ill., part interest to each

Continuation-in-part of Ser. No. 243,614, April 13, 1972. This application Apr. 13, 1972, Ser. No. 243,615

Int. Cl. E04b *2/00*

U.S. Cl. 52—262 **10 Claims**



A construction for modular bathrooms and powder rooms which includes a peripheral, panel-positioning floor track and at least four rectangularly-shaped wall panels, two of which are end wall panels and at least two of which are side wall panels. Each panel includes a unitary frame having top and bottom plate members and a plurality of parallel channel-like frame members joined at their ends to the top and bottom plate members. In one embodiment a premolded sheet-like fiber-glass/polyester member may be secured to the frame to provide a finished decorative face for the room, and a layer of polyurethane foam is applied to the back of said sheet-like member and to portions of said unitary frame for reducing

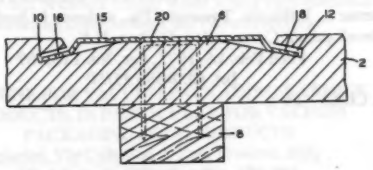
sound transmission through said panel and aiding in securing said face to said frame. Turnbuckle means are provided for engagement with rib-like projection means provided integral with the top and bottom plates for drawing and securing adjacent panels into close relation. Ceiling panel means may also be provided which are hung from the top edges of the wall panels by unique hanger means and gasket means are provided for sealing the joint between the ceiling and the wall panel and for providing an attractive appearance along said junction.

3,745,734

JOINT CONSTRUCTION FOR CEILING PANELS

John R. Davey, Camp Hill; Charles F. Gilbo, Lancaster; Norman A. Johnson, Lititz, and Thomas W. Fritz, East Petersburg, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed June 16, 1971, Ser. No. 153,508
Int. Cl. E04c *1/34*
U.S. Cl. 52—311 1 Claim



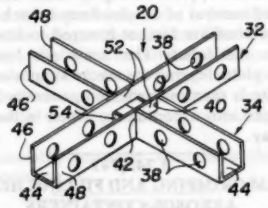
An improved joint structure for a strip concealing means which covers fasteners that hold a ceiling panel in position. Angled grooves are provided in a ceiling board for receiving a strip. Between the angled grooves, staples are placed to fasten the board in position, and the strip is placed in the grooves to conceal the staples.

3,745,735

TILE-SPACING CONSTRUCTION

Frank V. Casano, 63 Debora Drive, Plainview, N.Y.

Filed Feb. 24, 1972, Ser. No. 229,034
Int. Cl. E04f *13/08*
U.S. Cl. 52—390 1 Claim



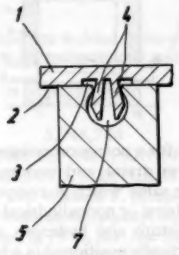
A member having utility in establishing uniform spacing in the layout of a tile arrangement, which member is so constructed that plural tile-spacing shapes can be made therefrom, when used along or in combination with a like member.

3,745,736

COMPOSITE WALL CONSTRUCTION

Artur Fischer; Gerhard Porlein, and Erich Schmid, all of Tumlingen, Germany, assignors to Artur Fischer, Tumlingen, Germany

Continuation-in-part of Ser. No. 816,702, April 16, 1969, abandoned. This application Jan. 22, 1971, Ser. No. 108,984
Claims priority, application Germany, Apr. 19, 1968, P 17 59 311.2; May 14, 1968, P 17 59 551.6
Int. Cl. E04c *2/46*
U.S. Cl. 52—511 12 Claims



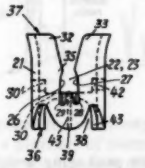
A supported element overlies a support element. The support element is provided with at least one groove of undercut configuration and the supported element is provided with one or more male coupling projections which are receivable with a snap action in this groove and undergo elastic deflection so as to enter the groove. To reduce friction, facilitate such elastic deflection, and thus facilitate snap-action introduction into the groove, the coupling projections engage the groove only with line contact and the surface of the supported element which faces the support element is provided with a depression or recess overlying the groove when the two elements are connected, with the coupling projection or projections extending from the bottom of this recess outwardly beyond the surface of the supported element.

3,745,737

SPACER MEMBER FOR REINFORCING RODS, IN REINFORCED CONCRETE CONSTRUCTION

August Keller, Im Buech 387, Wurenlos, and Hans Keller, Haldenstrasse 26, Nussbaumen, both of Switzerland

Filed Nov. 15, 1971, Ser. No. 198,603
Claims priority, application Switzerland, Nov. 18, 1970, 17089/70
Int. Cl. E04c *5/16*
U.S. Cl. 52—687 5 Claims

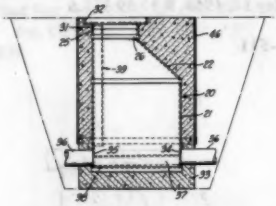


A profiled member, such as an essentially elongated cylinder, is formed with at least two spacially relatively offset openings therein, the openings being of such size to receive reinforcing rods, and formed to engage the rods and interlock therewith. The profiled members are open at both ends to permit pouring of cement therethrough.

3,745,738
CORROSION RESISTANT MANHOLE SHAFT AND METHOD OF MAKING SAME

Frederic J. Singer, 715 S. Nakama Drive, Santa Ana, Calif.

Filed Sept. 7, 1971, Ser. No. 176,418
Int. Cl. E02d 29/12
U.S. Cl. 52—741 9 Claims



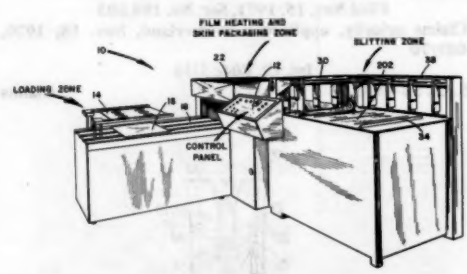
This invention is for a corrosion resistant manhole shaft for sewer drains, storm drains and underground vaults and a method of making same which is comprised of tubular elements either cylindrical or noncylindrical of reinforced plastic impervious to moisture and hydrogen sulfide, said tubular members being vertically positioned in a hole in the ground intercepting the path of a sewer line or an underground chamber and extending upward to the level of the ground surface. A removable liner is positioned about the vertically aligned tubular members and radially spaced therefrom. Concrete is poured into the cavity between the exterior of the tubular members and the liner. Thereafter, the liner is removed and sand or other similar fill is poured into the ground hole between the ground hole wall and the hardened concrete.

This invention is also for a method of making corrosion resistant manhole shafts by spraying or blowing to a desired thickness a glass reinforced polyester or other plastic which is impervious to moisture and hydrogen sulfide upon the inner surface of existing conventional manhole shafts, so as to form a plastic liner.

3,745,739
APPARATUS AND METHOD FOR SKIN PACKAGING ARTICLES

Bernhardt Madsen; Edward R. Pozsony, both of Clarks Summit, Pa., and Everett E. Collin, Camillus, N.Y., assignors to U. S. Packaging Corporation, Greenville, S.C.

Filed Mar. 24, 1971, Ser. No. 127,647
Int. Cl. B65b 31/00
U.S. Cl. 53—22 A 17 Claims



A system for skin packaging articles including a loading zone for positioning articles to be packaged upon a substrate, a thermoplastic film heating and vacuum operated skin packaging zone for covering the articles with film laminated to the substrate and a slitting zone for separating and trimming the individual skin packaged articles. The articles are passed to the successive zones. The loading zone may be adapted for conveyorized instead of hand loading. In some cases, where only transverse cutting of the film web is necessary, it may be desirable to eliminate the slitting zone and remove the skin packaged article or articles directly from the packaging zone. A conveniently located operating panel contains controls for effecting automatic, semi-automatic or manual operation of the entire system or any portions thereof in any manner desired.

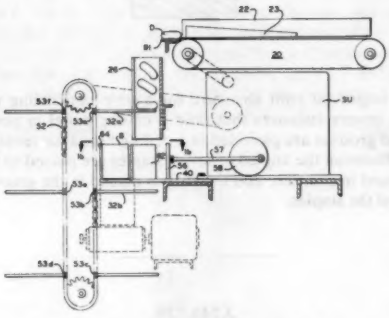
More specific novel features of the invention comprise the provision of heat shield plates pivotally mounted for positioning above the heating elements to serve as reflectors to direct heat uniformly downwardly upon the film to be softened and deformed in the skin packaging zone and, alternatively, for positioning beneath the heating elements to shield the deformed film from further heating as desired during the vacuum skin packaging operation. Another specific feature comprises the novel arrangement of discs or other cutting means in the slitting zone to maintain an uncut border at opposed ends of the substrate board and laminated film so that the longitudinally slit strips of skin packaged articles within the border may be handled as a unit for separating into individual packages by a terminal transverse slitting operation.

The invention visualizes the heating and packaging zone as a nucleus of the system around which selected article loading, removal and other devices may be associated to suit the requirements of specific article skin packaging operations.

3,745,740
PACKAGING METHOD AND APPARATUS

Thomas A. Williams, Towanda, Pa., assignor to Scott Machine Development Corporation, Walton, N.Y.

Filed Feb. 16, 1971, Ser. No. 115,169
Int. Cl. B65b 35/50
U.S. Cl. 53—26 10 Claims



Method and apparatus for stacking and packing frangible generally cylindrical articles such as doughnuts includes expelling successive such articles from the end of a conveyor means so that the articles fall successively into hollow, generally vertical tubes. Arms extending inside the tubes are gradually lowered as successive articles fall into the tubes so that all articles fall approximately the same distance. When a predetermined number of articles form a stack within each of the tubes, the arms are further lowered to lower the formed stacks below the tubes. The arms are lowered through openings in a plate, leaving the stacks supported on the plate. A pusher plate is then reciprocated generally horizontally to push the stacks into a container, which is then righted and conveyed away.

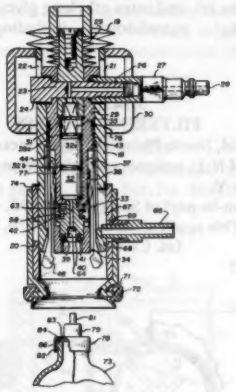
3,745,741
VACUUM CRIMPING AND FILLING HEAD FOR AEROSOL CONTAINERS

Ernest Cunningham, Libertyville, and Marshall Dodson, Marengo, both of Ill., assignors to Barr-Stalfort Company, Division Pittway Corporation, Niles, Ill.

Filed Jan. 31, 1972, Ser. No. 222,044
Int. Cl. B65b 31/02
U.S. Cl. 53—88 5 Claims

Vacuum crimping and filling head apparatus for pressure filling an aerosol container. In sequential action air is

withdrawn from the container, followed by simultaneous crimping of the valve assembly onto the mouth of the container and pressure filling. Downward movement of the head



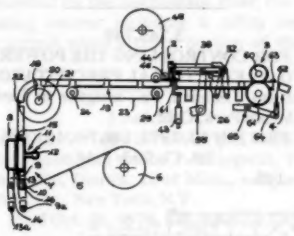
opens the valve of the container and the filling head check valve to permit pressure filling, while a ring cam-actuated inwardly contracting collet crimps the valve assembly.

3,745,742

MACHINE FOR VACUUM PACKAGING VARIOUS PRODUCTS, IN PARTICULAR FOR VACUUM PACKAGING FOOD PRODUCTS

Cesare Tartarini, Via Colombo 9, Zola Predosa, Italy

Filed Sept. 7, 1971, Ser. No. 178,001
Claims priority, application Italy, Sept. 11, 1970, 3546A/70
Int. Cl. B65b *31/02*
U.S. Cl. 53—112 A **3 Claims**



Vacuum packaging machine for food products, having conveyer means conveying a tape of moldable plastics to a vacuum forming station where depressions are vacuum formed in said tape for receiving the food products in such depressions. After a filling station where the food products are introduced into the depressions there is provided an evacuation closing and welding station, where filled depressions are covered by a tape of plastics material with the interposition of a suction mouth between the covering tape and one of the edges of the depressions, which evacuates the filled depressions while a welder welds the covering tape along the edges of the depression.

A cutting assembly separates afterwords the closed and evacuated depressions.

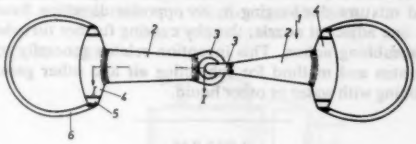
3,745,743

METHOD FOR MAKING A BRIDOON

Herbert Alfred Sprenger, 5860 Iserlohn, Germany

Filed Mar. 8, 1972, Ser. No. 232,809
Claims priority, application Germany, Mar. 15, 1971, P 21 12 376.2
Int. Cl. B68b *1/06*
U.S. Cl. 54—8 **5 Claims**

A method for the manufacture of a bridoon particularly suitable for horses constructed of a rust-proof steel whereby at least two pipe pieces are tapered on at least one end thereof and flatened so that a ring can be welded on the tapered flatened end and adjacent rings joined together. On the opposite ends of the pipe are welded olive-shaped jackets provided with enlarged rings for receiving and mounting the bridle.



3,745,744

PROCESS FOR THE SEPARATION OF DIENE FROM ORGANIC MIXTURES

Eli Perry, St. Louis, and William F. Strazik, St. Ann, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 8, 1972, Ser. No. 232,976
Int. Cl. B01d *53/22*
U.S. Cl. 55—16 **6 Claims**

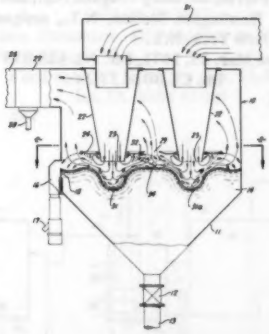
Dienes are separated from organic mixtures comprising diene and alkene having one double bond by contacting the mixture against one side of a cyanoethyl cellulose membrane and withdrawing at the other side a vaporous mixture having increased diene concentration. Exemplary of the organic mixtures is a mixture of butadiene and butene. The cyanoethyl cellulose perferably has a degree of substitution (D.S.) of from about 0.57 to 3.0.

3,745,745

SCRUBBING APPARATUS AND METHOD

Ernest Mare, c/o Jack Melvin, Kreb Engineering, 1205 Chrysler Drive, Menlo Park, Calif.

Filed Jan. 28, 1972, Ser. No. 221,638
Int. Cl. B01d *47/02*
U.S. Cl. 55—95 **5 Claims**



An apparatus and method for scrubbing gases with liquid. The apparatus employs a plurality of nozzles which discharge several streams of the gas downwardly against the surface of the scrubbing liquid (e.g., water). Each nozzle has a shield which overlies the liquid body and confines the movement of gas and entrained liquid from the region of impingement with the liquid. The nozzles and their shields are arranged in a cluster within a reservoir. In carrying out the method, the gas flow is discharged from the several nozzles and caused to impinge on the surface of the liquid, the flow velocity being such that depressions are formed in the liquid body immediately below the nozzles. Some initial scrubbing action is effected by such impingement, and the impingement causes some of the

liquid to be entrained in the gas flow whereby a gas-liquid mixture flows outwardly in a radial direction from the region of each depression and through the spaces underlying the shields. Also, the gas-liquid mixture discharging from the region of each depression is caused to intermingle with the gas-liquid mixture discharging in an opposite direction from at least one adjacent nozzle, thereby causing further turbulence and scrubbing action. This invention relates generally to an apparatus and method for subjecting air and other gases to scrubbing with water or other liquid.

3,745,746

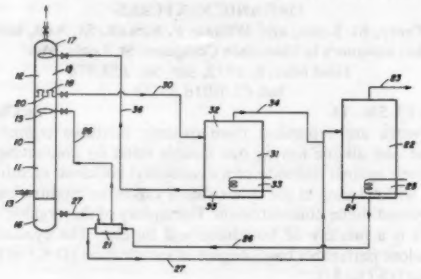
DEHYDRATION PROCESS

Hippocrates G. Psyras, Berkeley Heights, N.J., and Arthur Angelo Bellisio, Huntington Station, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 127,943

Int. Cl. B01d *53/14*

U.S. Cl. 55—31 **18 Claims**



A method of dehydrating gases using N-alkyllactams is described. Included are steps for the recovery of any entrained vapors of the N-alkyllactams from the dehydrated gas streams and the recirculation of the recovered lactams thus reducing the operating cost of such process.

3,745,747

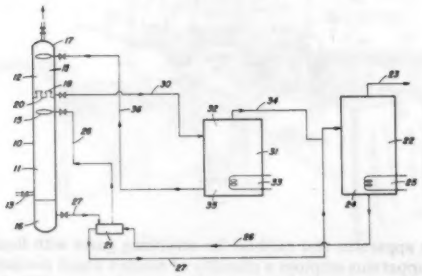
GAS PURIFICATION SYSTEM

Hippocrates G. Psyras, Berkeley Heights, N.J., and Arther Angelo Bellisio, Huntington Station, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 128,075

Int. Cl. B01d *53/14*

U.S. Cl. 55—31 **20 Claims**



A method as disclosed for the recovery of N-alkylated lactams and particularly N-methyl pyrrolidone which may become entrained in gas streams treated with such materials. The lactams are useful, specific, absorbing solvents used in the sweetening and dehydrating of natural gases and also for the selective solvation of various components or impurities from mixed gas streams. During such treatments, the lactams become vaporized or entrained in the gas streams. In the process of this invention, the entrained N-alkyllactam is selectively recovered by the treatment of the gas stream with liquid solvents for the N-alkyllactam. Among suitable solvents for the recovery of the usually used lactams, including methyl pyrrolidone, are the tri- and tetra ethylene glycols and the higher boiling N-alkyl pyrrolidones including N-cyclohexyl pryyolidone.

3,745,748

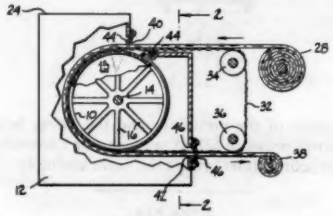
FILTERING PROCESS

Joseph Goldfield, North Plainfield, and Vincent Greco, Martinsville, both of N.J., assignors to Johns-Manville Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 869,495, Oct. 27, 1969, abandoned. This application Oct. 29, 1970, Ser. No. 85,005

Int. Cl. B01d *25/24*

U.S. Cl. 55—97 **10 Claims**



Filtration of submicron liquid and solid particles from large volumes of gas in which the particles are carried is accomplished by passing the gas through a filter medium made up of fibers having an average diameter of up to about 10 microns at a velocity of at least 300 feet per minute and at a pressure drop not greater than 40 inches of water to remove at least 80 percent of such particles.

3,745,749

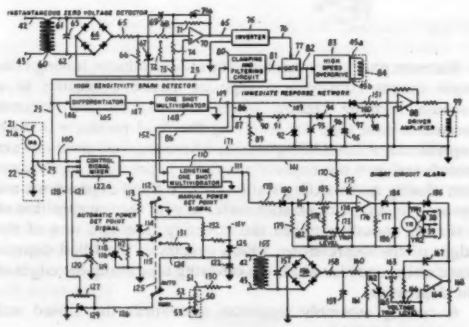
CIRCUITS FOR CONTROLLING THE POWER SUPPLIED TO AN ELECTRICAL PRECIPITATOR

Peter C. Gelfand, Lebanon, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed July 12, 1971, Ser. No. 161,606

Int. Cl. B03c *3/68*

U.S. Cl. 55—105 **37 Claims**



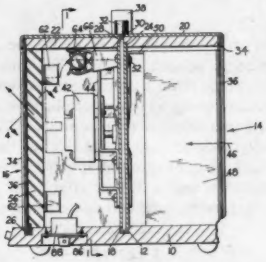
A system for controlling the level of operation of a precipitator through the use of analog computer circuits programmed to respond to sparking and short circuits. Reference pulses representative of instantaneous zero excursions of voltage control a gate that receives precipitator current pulses. When the reference pulses coincide with the current pulses, due to sparking, output signals reduce the power level of the precipitator. A high sensitivity spark detector circuit also reduces the power level in response to low intensity precipita-

tor sparks. Following reduction of the power level, power in the precipitator is rapidly reapplied to establish a new level of operation slightly lower than the original level, and this level is then slowly raised until sparking again occurs. The analog computer circuits are also programmed to monitor and compare precipitator voltage and current to shut down the precipitator power supply upon occurrence of a destructive short circuit.

3,745,750
AIR PURIFIER

John H. Arff, 118 N.E. 24th Ave., Portland, Oreg.

Filed Jan. 11, 1971, Ser. No. 105,344
Int. Cl. B03c *3/32*
U.S. Cl. 55—102 **2 Claims**

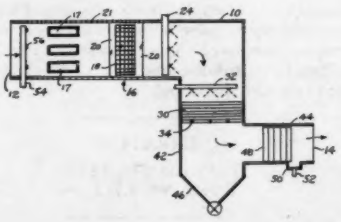


An air purifier having an electrostatic filter and a charcoal filter for removing airborne impurities. The purifier has blower means for moving air therethrough and also includes air treating means in the form of an ozone generator or ultraviolet lamp. The charcoal filter has longitudinal openings which in a preferred construction are angled upwardly to move the output air toward the ceiling. Electrical control means are provided for the electrostatic filter, the blower, and the air treating means, including a safety switch which deadens the circuit when a cover portion of the purifier is removed.

3,745,751
SULFUR DIOXIDE COLLECTION SYSTEM

Aubrey F. Zey, Southgate; Julius V. Przygocki, Trenton, and Philip Van Huffel, Detroit, all of Mich., assignors to American Standard Inc., New York, N.Y.

Filed Oct. 26, 1970, Ser. No. 83,933
Int. Cl. B03c *9/00*
U.S. Cl. 55—122 **1 Claim**

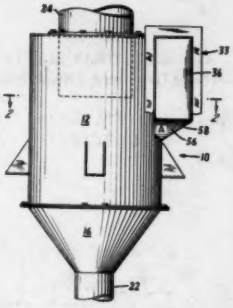


A sulfur dioxide collection system comprising ozone-producing electrodes upstream from a baghouse, electrostatic precipitator, or scrubber, etc., whereby ozone is produced and simultaneously reacted with sulfur dioxide in the gas stream, thereby forming sulfur trioxide which is converted to sulfuric acid mist prior to or after entry into the conventional collector. The collection system removes the acid mist, (together with particulates, if any) from the flowing gas.

3,745,752
FLUID INLET STRUCTURE FOR CYCLONE COLLECTORS

Charles A. Gallaer, Palmyra, Pa., assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Dec. 30, 1970, Ser. No. 102,849
Int. Cl. B04c *5/04*
U.S. Cl. 55—418 **4 Claims**

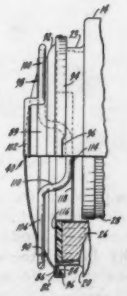


A fluid inlet structure for a cyclone collector includes an inlet conduit having an inlet end opening remote from the cyclone chamber and an outlet opening which constitutes the inlet to the chamber. An inlet flow guide has an upstream portion substantially contiguous to the inlet conduit and an outer wall which converges with the chamber in the downstream direction for guiding fluid flowing through the inlet conduit into the chamber. The cross-sectional shape and dimensions of the inlet conduit vary in size along the direction of flow for gradually generating a velocity gradient in the fluid conduit flow at the outlet opening such that the velocities of flow streams at the outlet opening are greater, the greater the distance they are from the housing axis. This velocity gradient results in all fluid entering the flow guide at about the same given point in time tending to progress around the guide substantially along an imaginary rotating plane and inhibits the formation of eddy currents in the inlet flow guide.

3,745,753
AIR CLEANER

Willis H. Risse, Flossmoor, Ill., assignor to United Filtration Corporation, Chicago, Ill.

Filed Apr. 27, 1970, Ser. No. 32,203
Int. Cl. B01d *45/00*
U.S. Cl. 55—481 **6 Claims**



An air cleaning device of the so-called all dry type for use in cleaning the air for internal combustion engines, air compressors and the like with a unitary type housing which is generally cylindrical in nature enclosing a generally cylindrical dry filter element with a dirty air inlet and a clean air outlet in which the housing is indented opposite the clean air inlet to prevent dirt from orbiting, the housing section is made from two halves

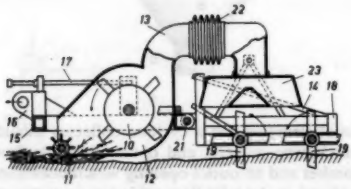
which are of generally equal size and length and of similar shape so that they can be crimped together at their abutting edges, a unitary distortable seal is used on the filter element itself to simultaneously seal and pilot the element, a bail mechanism is used to simultaneously clamp the closure in place and also apply an axial thrust to the filter element, and the housing has reduced portions at each end to properly center the filter element.

3,745,754

AGRICULTURAL MACHINE

Sven Jorgen Gerhard Gronberg, Ottum L 6, 530 20, Kvanum, Sweden

Filed Feb. 9, 1972, Ser. No. 224,679
Int. Cl. A01d *43/12*
U.S. Cl. 56—14.4 **3 Claims**



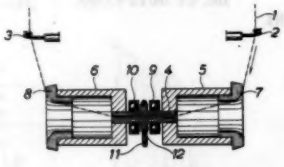
A machine for the treatment of straw distributed over the ground by a harvesting machine in which a first component includes a catching means and a rotary cutter, and a second component includes a soil cultivating means, with a conduit transferring the broken-up straw from the first component and terminating in distribution branches adjacent to the parts of the cultivating means entering into the soil.

3,745,755

IMPROVEMENT IN A FALSE-TWIST SPINDLE IN A FILAMENT FALSE-TWIST CRIMPING MACHINE

Kalevi Keto, Kirkkonummi, Finland, assignor to Spinner Osakeyhtio, Karakallio, Finland

Filed Jan. 20, 1971, Ser. No. 107,881
Int. Cl. D02g *1/06*
U.S. Cl. 57—77.4 **7 Claims**



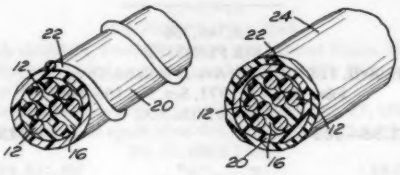
A false-twist spindle is provided for use in a filament false-twist crimping machine in which a filament of artificial substance is first heated and then conducted radially into the false-twist spindle, axially through the sleeve and radially out of the same, this false-twist spindle being journalled in the body of the machine and arranged to rotate about its axis and being provided at both ends with friction rings, which present high friction against the filament and which are contacted by the filament along a curved path. The invention is characterized in that between the friction rings the false-twist spindle forms a tube having a diameter smaller than that of the friction rings and the inner surface of which tube is for the false-twist spindle polished, and in that the bearings are placed on the outside of said tube.

3,745,756

CONSTRUCTION OF TENNIS STRINGS

Julian T. Crandall, Washington County, Ashaway, R.I., assignor to Ashaway Line & Twine Mfg. Co., Ashaway, R.I.

Filed Feb. 7, 1972, Ser. No. 225,151
Int. Cl. D02g *3/38, 3/36, 3/22*
U.S. Cl. 57—149 **13 Claims**



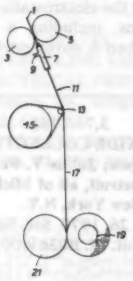
A string for use in connection with athletic rackets, such as tennis, badminton, squash and the like comprising a thermoplastic core made from a plurality of twisted thermoplastic strands, said core having a coating of plastic material covering and integrated therewith, a thermoplastic filament wrap extending spirally around said coated core, the pitch of said wrap being such that substantial spacing exists between adjacent convolutions, and a further coating of plastic material covering and integrated with said coated and wrapped core.

3,745,757

METHOD OF MAKING TEXTILE YARNS

Alan Selwood, Allt-yr-Yn, Newport, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 10, 1971, Ser. No. 141,713
Claims priority, application Great Britain, May 20, 1970, 24,421/70
Int. Cl. D02g *3/00*
U.S. Cl. 57—157 R **11 Claims**



A compact yarn of staple fibres containing at least a proportion of potentially adhesive fibres bonded to contacting fibres. The compact yarn may be made by false twisting a sliver of the staple fibres by means of a fluid vortex followed by activating the potentially adhesive fibres.

ERRATUM

For Class 57—59 see:
Patent No. 3,745,764

3,745,758

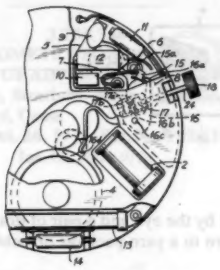
ELECTRIC AND ELECTRONIC TIMEPIECE

Masahiro Kuritz, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 888,773, Dec. 29, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 174,601
Int. Cl. G04c *3/04*; G04b *27/00*
U.S. Cl. 58—23 A **5 Claims**

An electric or electronic timepiece having at least one transistor the base of which is polarized by a source of current,

and switch means in the control circuit for said transistor, whereby the "rest current" from said source of current when



said switch means is open is low when compared with the current consumed when said switch means is closed.

3,745,759

ELECTRIC TIMEPIECE

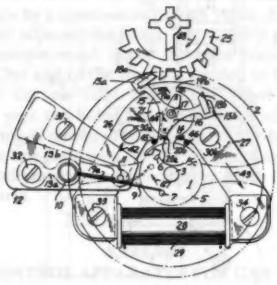
Moriyoshi Kurosawa, Funabashi-shi, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 13, 1970, Ser. No. 89,231

Claims priority, application Japan, Dec. 8, 1969, 44/97801

Int. Cl. G04c *3/04*

U.S. Cl. 58—28 R **8 Claims**



This invention relates to an electric timepiece containing a mechanical contact actuated by the movement of the balance wheel together with the electronic circuit combined thereto, in which the pallet is electromagnetically driven by said electronic circuit, to drive said balance wheel mechanically and to rotate the escapement wheel to drive the gear trains engaging with the escapement wheel so as to make time-display.

3,745,760

ELECTRONIC SWITCH FOR TIMEPIECES

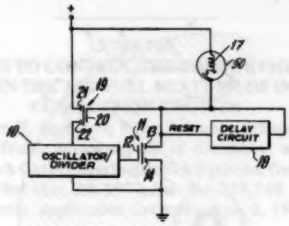
Eugene R. Keeler, Suffern, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Jan. 10, 1972, Ser. No. 216,684

Int. Cl. G04c *3/04*

U.S. Cl. 58—28 R **12 Claims**

An electronic switch to provide a long storage life for the battery used in timepieces such as quartz watches is disclosed. The switch includes a transistor connected between the oscillator divider and power supply and a delay circuit coupled across the output from the oscillator-divider and controlling the aforesaid transistor. When the balance wheel is held off normal, the delay circuit opens the series switch transistor after a predetermined time interval to minimize battery drain. In a second embodiment, a shunt mode of operation is provided wherein the output driver transistor is controlled by a second transistor from the delay circuit. A third transistor in the oscillator input is similarly controlled by the delay circuit.



When the balance wheel is held off normal, the delay circuit turns on the second and third transistors thereby minimizing battery drain.

3,745,761

ELECTRONIC TIMEPIECE HAVING ALARM MEANS

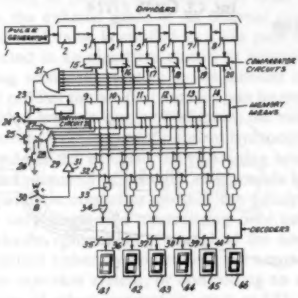
Yuki Tsuruishi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 4, 1972, Ser. No. 223,667

Claims priority, application Japan, Feb. 18, 1972, 46/7160

Int. Cl. G04c *21/00*

U.S. Cl. 58—38 **11 Claims**



An electronic timepiece having a pulse generator for producing a high frequency time standard signal, a divider circuit for producing low frequency timing signals in response to said time standard signal and a device for digitally displaying time in response to said timing signals, is provided with an alarm adapted to be actuated at a predetermined time. The timepiece includes a memory device for storing said predetermined time, a comparator device for comparing the stored predetermined time and the instantaneous information in said divider means and a device for driving said alarm in response to the output of said comparator device.

3,745,762

DEVICE FOR INDICATION OF THE HOUR IN A TIMEPIECE

Hans Kocher, Buren an der Aare, and Peter Schmied, Diessbach b/Buren a.A, both of Switzerland, assignors to Buren Watch Company S.A., Berne, Switzerland

Filed Jan. 4, 1972, Ser. No. 215,300

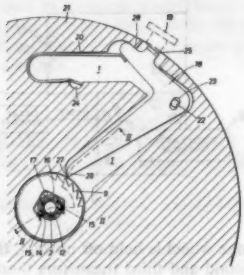
Claims priority, application Switzerland, Jan. 28, 1972, 1246/71

Int. Cl. G04b *27/00*

U.S. Cl. 58—85.5 **8 Claims**

A device for adjusting the hour hand of a timepiece from outside the timepiece without moving the cannon pinion or

the minute pinion wherein a coaxial coupling in which two or more balls are provided on one coaxial element such that each



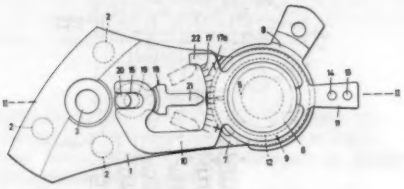
of the balls can successively engage in notches provided in the other coaxial element.

3,745,763

FINE-ADJUSTMENT DEVICE FOR WATCH-MOVEMENT REGULATOR-ASSEMBLY

Roland Zaugg, Grenchen, Switzerland, assignor to A. Schild S.A., Grenchen (Canton of Soleure), Switzerland

Filed July 7, 1972, Ser. No. 269,543
Int. Cl. G04b 17/14
U.S. Cl. 58—109 5 Claims



A fine-adjustment device for watch-movement regulator-assemblies, comprising a control organ pivoting on a balance-cock and provided with an eccentric functioning together with a regulator-tail; wherein the control organ comprises a finger-piece extending towards the regulator axis within a cut-out which is laterally open on one of the sides of the regulator-tail, that the regulator tail is provided with a hub located on a fixed component fastened to the cock and compressed by an adjustable regulator ring surrounding the hub and located at the same level as the control organ, this ring being provided with an arm supporting regulator pin and key or balance-spring boot.

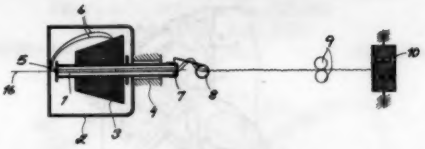
3,745,764

METHOD OF AND TENSION-REGULATING DEVICE FOR TIGHT-TWISTING OF THREADS

Gueorgui Mitov Petrov, Sofia, Bulgaria, assignor to BTR "Pamukotec" Botevgradsko Chaussee, Sofia, Bulgaria

Filed Oct. 26, 1970, Ser. No. 83,972
Claims priority, application Bulgaria, Nov. 1, 1969, 13282
Int. Cl. D01h 7/02
U.S. Cl. 57—59 4 Claims

A method of and a tension-regulating device for the tightt-wizting of a pair of non-twisting threads unwound from a bobbin or yarn package, wherein the threads are passed without twisting through a hollow spindle, are wound one or more times around an arm of the tension-regulating device and are then passed through the eye thereof. Within the spindle, the threads are stretched and are length -equalized, the twisting



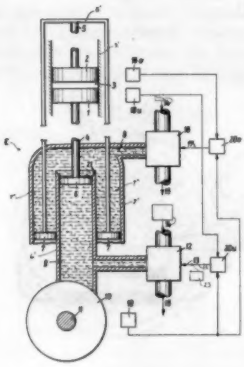
being effected by the eye and a pair of drawing rollers feeding the twisted yarn to a yarn package or bobbin upon which it is wound.

3,745,765

DEVICE FOR VENTILATING HYDROSTATIC MOTION CONVERTERS IN FREE-FLOATING PISTON ENGINES

Wolfgang Raebiger, Buckenhofen, Germany, assignor to Grundig, Furth/Bay, Germany

Filed Dec. 8, 1971, Ser. No. 205,886
Claims priority, application Germany, Feb. 11, 1971, P 21 06 405.1
Int. Cl. F03g 7/06
U.S. Cl. 60—24 10 Claims



A device for ventilating the hydrostatic motion converters of free-floating piston engines is provided wherein two countercurrent driving pistons are enclosed in each engine cylinder to define joint combustion chambers and drive independent hydrostatic motion converters. The device includes means for detecting the momentary or instantaneous position of each of the pistons in the cylinder and producing output signals representative of those positions. The momentary or instantaneous angular position of the engine output shaft is detected by an independent detector which produces an output signal representative of that position. Individual comparing means receive the output signals from the shaft detecting means and the respective piston detecting means and compare these output signals to produce individual synchronization error signals for each cylinder, which signals are representative of the synchronization error between the instantaneous locations of the pistons in that cylinder and the instantaneous angular location of the shaft. Liquid control means responsive to the synchronization error signals vary the quantity of liquid in the hydrostatic motion converters between the cylinders and the output shaft to reduce the synchronization error. Means are also provided for supplying a constant interference signal, representative of a loss of liquid in the hydrostatic converter, to the liquid control means of one of the pistons, in lieu of the signal from one of the comparing means associated with that

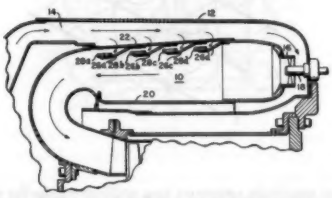
piston, while the other of the piston detecting means is in normal operation, so that gases in the hydrostatic system escape therefrom through the liquid varying means associated with the other of the pistons.

3,745,766

VARIABLE GEOMETRY FOR CONTROLLING THE FLOW OF AIR TO A COMBUSTOR

Jerry O. Melconian, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Oct. 26, 1971, Ser. No. 192,411
Int. Cl. F02c 9/14
U.S. Cl. 60—39.23 13 Claims



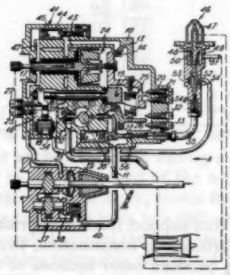
The outer liner of an annular combustion chamber for a gas turbine engine is constructed of a rigid cylinder having a plurality of air inlet holes downstream of the primary combustion zone. The amount and the velocity of the air admitted through the air inlet holes to the combustor is controlled as a function of temperature by a construction which varies the geometry of the combustor adjacent the holes. The variable geometry consists of a frustro-conical sleeve mounted coaxially with the outer liner. One end of the sleeve is welded to the outer liner upstream of the air inlet holes. The other end extends downstream past the holes and provides an air inlet gap. A corrugated ring is mounted in the gap on the free end of the sleeve. As the hot gases pass over the sleeve, it expands closing the gap to a minimum determined by the depth of the corrugations of the strip.

3,745,767

FUEL CONTROL APPARATUS FOR GAS TURBINE ENGINES

Joseph Lewis Bloom, Droitwich, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Sept. 23, 1971, Ser. No. 183,058
Int. Cl. F02c 9/10
U.S. Cl. 60—39.28 T 13 Claims



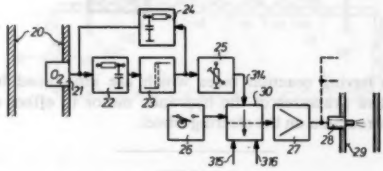
A fuel control apparatus for a gas turbine engine comprises a metering orifice and a closure member for the orifice. The closure member is movable in response to engine speed and pressure signal from the engine compressor. The pressure signal is modified by a device sensitive to engine temperature. At engine temperatures above a predetermined level the device also modifies the position of the closure member directly and in a sense opposite to that applied by the modification of the pressure signal.

3,745,768

APPARATUS TO CONTROL THE PROPORTION OF AIR AND FUEL IN THE AIR-FUEL MIXTURE OF INTERNAL COMBUSTION ENGINES

Richard Zechnall, Stuttgart; Peter Schmidt, Schwieberdingen, and Josef Wahl, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Mar. 30, 1972, Ser. No. 239,740
Claims priority, application Germany, Apr. 2, 1971, P 21 16 097.4
Int. Cl. F02b 75/10
U.S. Cl. 60—276 27 Claims



An oxygen analyzer responsive to oxygen partial pressure and comprising an oxygen ion conductive solid electrolyte is exposed to the exhaust gases of an internal combustion engine. The sensed value is applied to a low pass filter which is interconnected in an electrical circuit to control the amount of fuel being admitted, relative to the amount of air, so that the air-fuel ratio of the air-fuel mixture can be maintained at a predetermined level. In one embodiment, the mixture is regulated to provide a minimum of unburnt hydrocarbon and carbon monoxide in the exhaust, the remaining noxious exhaust gases formed primarily of nitrogen compounds being neutralized by a catalytic converter, so that the catalytic converter need have only single bed neutralizing only one substantial noxious exhaust component. Control of the amount of fuel can be obtained either by controlling the amount of fuel injected in an injection system, or controlling an additional air path. Sensing of other parameters, such as CO, temperature, and the like, may also be provided.

3,745,769

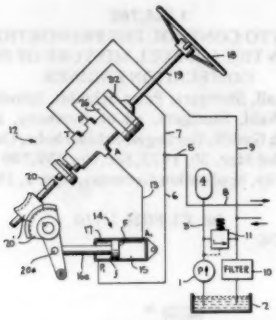
HYDRAULIC SERVO-STEERING SYSTEM

Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Nov. 11, 1971, Ser. No. 197,710
Int. Cl. F15b 15/18
U.S. Cl. 60—392 1 Claim

A hydraulic servo-steering system for vehicles having wheels in which there are provided a supply reservoir, a pressure source and a steering wheel unit defined by the wheel per se, a spindle composed of first and second sections arranged relatively movable toward each other by a small amount, with one section being connected to the steering wheel and the other to a steering mechanism for the wheels. At least one hydraulic motor which reacts on a counter-rotation of the sections is engaged suchwise as to effect a support of the steering movement of the wheels and a return signal device which signals back to the steering wheel a moment of reaction in accordance with the outer momentum. A control device for the pressure medium and the return signal device is provided with pistons arranged in a valve body transverse to the longitudinal axis of the spindle sections and eccentric thereto so that the valve body is connected with the steering mechanism and with connections for the pressure medium whereby the supply and removal of the pressure medium is ensured independent of the

angular position of the valve body. An operating member serves to actuate the pistons independently of the relative position of the two sections toward each other, with the



pistons having reaction faces which are influenced by the respective pressures of the hydraulic motor to effect a moment of reaction on the steering wheel.

3,745,770

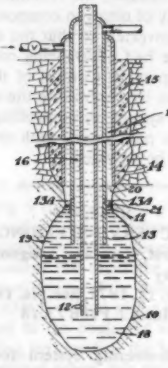
METHOD FOR THE SUBTERRANEAN STORAGE AND WITHDRAWAL OF A LIQUID

Jack C. W. Fraser, Raymond R. Swanke, and Jules E. Arbour, III, all of Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 8, 1971, Ser. No. 205,924

Int. Cl. B65g *5/00*

U.S. Cl. 61—.5 **4 Claims**



Three concentrically displaced conduits are supported in a borehole connecting the surface of the earth with a storage cavity. The first smaller and inner conduit descends to a short distance from the bottom of the cavity. The second next larger conduit descends a short distance below the roof of the cavity. The third and largest conduit is cemented into the borehole wall and descends to a distance above the roof of the cavity leaving a portion of the borehole wall exposed. The stored liquid fills the first conduit and a portion of the cavity. A displacing luqiid, less dense than the stored liquid, fills the remainder of the cavity and the annular space between the first and second conduit. A sealing luqiid which is not harmful to the formation and which is less dense than the displacing liquid, fills the annular space between the second and third conduit and also a major portion of the exposed portion of the borehole wall.

3,745,771

INFLUENCING SEDIMENTATION

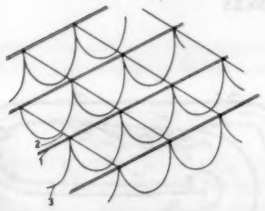
Paul Cephas Rhodes, Harrogate, and Stanley Temple Cope, Horse Heath, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 4, 1971, Ser. No. 103,419

Claims priority, application Great Britain, Feb. 25, 1970, 9,114/70

Int. Cl. E02b *3/12*

U.S. Cl. 61—38 **11 Claims**



This invention relates to artificial seaweed arrays for influencing the sedimentation and movement of solid particles of material in seas, lakes and other bodies of water and in particular to a more easily laid unified array structure and a method for laying it.

3,745,772

HYDRAULIC ROOF-SUPPORT FRAME

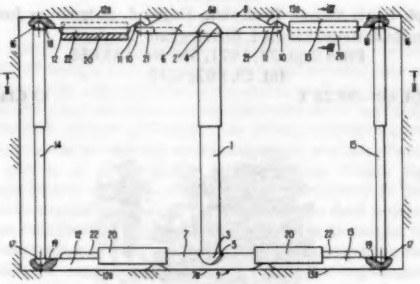
Josef Welzel; Hans Bull, both of Wuppertal-Elberfeld, and Alfred Maykemper, Wuppertal-Barmen, all of Germany, assignors to Hermann Hemsheidt Maschinenfabrik, Wuppertal-Elberfeld, Germany

Filed Dec. 10, 1971, Ser. No. 206,794

Claims priority, application Germany, Dec. 23, 1970, P 20 63 466.6

Int. Cl. E21d *15/44*

U.S. Cl. 61—45 C **5 Claims**



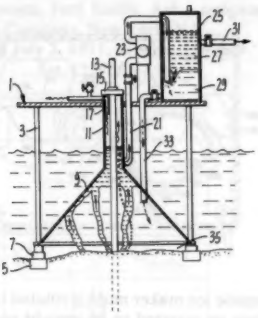
An hydraulic roof-support frame comprising floor and roof beams each of articulated construction, two outer hydraulic props extending between outer sections of the beams, at or near the ends of the latter, and at least one intermediate hydraulic prop, of greater strength than the outer props, extending between central portions of the beams, the said central portions having roof-engaging and floor-engaging surfaces of substantially greater area than the corresponding surfaces on the outer sections of the beams.

3,745,773

SAFETY OFF-SHORE DRILLING AND PUMPING PLATFORM

Byron H. Cunningham, Saratoga, Calif., assignor to Offshore Recovery System Inc.

Filed June 16, 1971, Ser. No. 153,507
Int. Cl. E02b *17/00*; E02d *23/00*; B01d *33/00*
U.S. Cl. 61—46 1 Claim



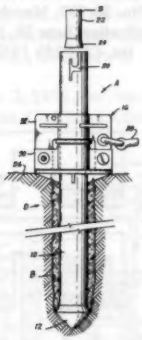
A safety off-shore drilling and pumping platform is provided wherein the platform is equipped with a large catchment basin which is spaced above the ocean floor and which has an opening therein so that drilling and pumping operations can be conducted within the catchment basin. In the event of an oil leak means are provided for recovering oil which rises in the catchment basin, saving the oil and preventing pollution.

3,745,774

UNDERWATER ANCHOR STRUCTURE AND METHOD OF SETTING SAME

Frank W. Sharp, Jr., Houston, Tex., assignor to The Offshore Company, Houston, Tex.

Filed July 27, 1970, Ser. No. 58,450
Int. Cl. B63b *21/00*; E02d *5/54*; E21b *7/12*
U.S. Cl. 61—46 4 Claims



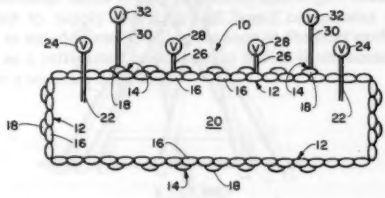
An underwater anchor structure having a tubular body, a drill bit secured to the lower end of the body, a stop plate secured to the exterior of the body, means for releasably connecting the upper end of the body to a drill string and a swivel joint rotatably mounted around the body above the stop plate, part of the joint being releasably connected to said body and the method of setting such underwater anchor structure including the steps of drilling a well bore underwater with the anchor structure attached to a drill string, flowing cement through the drill string and the anchor structure into the well bore, releasing the drill string from the anchor structure and recovering the drill string while leaving the anchor structure cemented in the well bore; this abstract is neither intended to define the invention of the application which, of course, is measured by the claim, nor is it intended to be limiting as to the scope of the invention in any way.

3,745,775

UNDERWATER IN SITU PLACEMENT OF CONCRETE

Lawrence F. Kahn, Ann Arbor, Mich., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1971, Ser. No. 201,016
Int. Cl. E02b *3/00*
U.S. Cl. 61—46 5 Claims



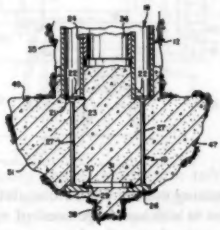
A flexible container filled with dry concrete which will quickly set upon the addition of moisture. Because of the container's flexibility, it may be formed into any desired container to fit available space after which moisture is added.

3,745,776

ANCHORING METHOD FOR OFFSHORE MARINE STRUCTURES

Laurence M. Hubby, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 13, 1971, Ser. No. 143,074
Int. Cl. E02d *5/44*
U.S. Cl. 61—53.6 4 Claims



The invention relates to a method for forming an anchoring or foundation base for an offshore marine structure. Said method includes the embedment of an elongated support member lower end, which extends downwardly into the substratum and upwardly through the body of water. The lower end of said member is firmly fixed in the substratum by the application of a cement jacket thereabout which terminates at the lower end of the column in an outwardly projecting, partially bulbous cement base.

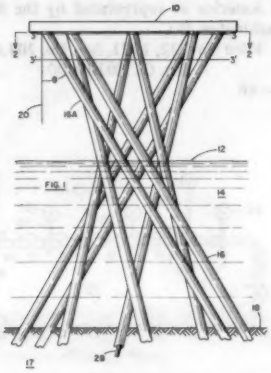
The apparatus for achieving said foundation includes an open structured anchoring cage which depends from the support member to form a firm engagement with the cement base.

3,745,777

CONFIGURATIONS FOR ICE-RESISTANT PLATFORMS

Kenneth A. Blenkarn, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed June 18, 1970, Ser. No. 47,403
Int. Cl. E02b *17/00*
U.S. Cl. 61—46 8 Claims



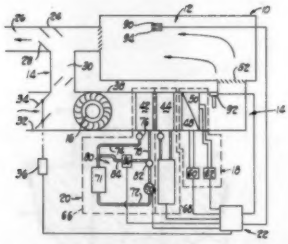
This concerns a deck or platform supported by piles above a body of water. The deck is supported by slanted or battered piles which converge to a small apex area at about the water line elevation. The slanted piles permit the horizontal transfer of load into the soil by means of axial loading on the piles.

3,745,778

METHOD AND SYSTEM FOR CONTROLLING AIR TEMPERATURE IN AN AIR CONDITIONED ZONE

Russell G. Attridge, Jr., Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Nov. 9, 1970, Ser. No. 87,963
Int. Cl. F25d *17/06*
U.S. Cl. 62—89 12 Claims



An air conditioning system for air circulating through an air conditioned zone is disclosed. A control system is provided which maintains a predetermined temperature in the zone by operating air heating and air chilling units of the system in either an on-off or a modulating mode. The system responds to the temperature of zone air and air flowing into the zone.

Two air cooling units are disclosed, the first one of which can be modulated in its cooling effect and a second unit, having a constant capacity, is operated only if the cooling load exceeds the capacity of the modulatable unit. When the cooling load is less than the full capacity of both units, the first unit is modulated while the second unit operates at capacity.

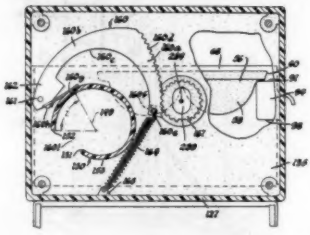
The air heating units are operated in stages. The sensed zone air temperature is primarily responsible for initiating cycles of the heating stages while the sensed duct air temperatures terminate operation of the heating stages. The heating stages have low thermal inertias so that they can be rapidly cycled.

3,745,779

HARVESTING MECHANISM FOR AUTOMATIC ICE MAKER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 12, 1972, Ser. No. 252,855
Int. Cl. F25c *1/10*
U.S. Cl. 62—135 3 Claims



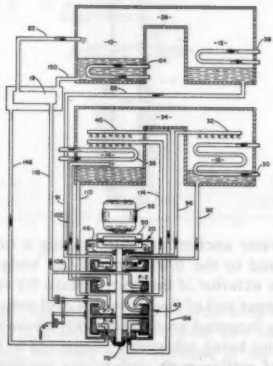
The automatic ice maker mold is rotated in a first rotational direction from an inverted to an upright position by a motor driven cam gear having a spiral cam thereon engaging the resiliently flexible cam follower leaf member portion of a pivoted spring biased sector gear whereby the leaf member acts in resilient opposition to the rotation of the cam gear to rotate the mold from an inverted to an upright position and thereafter retaining the mold during water filling and freezing cycles. The ice harvesting cycle commences by reenergization of the motor to continue the rotation of the cam gear until the flexible leaf member drops-off the high portion of the spiral cam releasing the spring biased sector gear to transmit a driving force to the mold in a second rotational direction causing a sudden inverting and impacting of the mold against stop means to dislodge the ice pieces therefrom into an ice collection bin.

3,745,780

ABSORPTION REFRIGERATION SYSTEM

Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 20,777, March 18, 1970, Pat. No. 3,608,332. This application June 21, 1971, Ser. No. 155,184
Int. Cl. F25b *15/06*
U.S. Cl. 62—141 1 Claim



An absorption refrigeration system wherein there is provided in communication with the evaporator, absorber, generator and condenser fluid handling apparatus in the form of a hermetic housing mounting therein a rotatively driven shaft member journaled at opposite ends in bearing means and

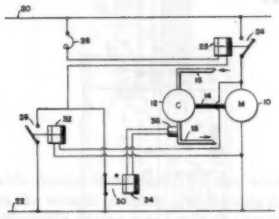
supporting a plurality of scoop pumps for effecting, among other functions, circulation of refrigerant and absorbent solution through the system, purging, and machine capacity control.

3,745,781

TIME DELAY CIRCUIT FOR A MOTOR COMPRESSOR SYSTEM

Ronald J. Rasmussen, Fort Smith, Ark., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed July 2, 1971, Ser. No. 159,129
Int. Cl. F25b *1/00*
U.S. Cl. 62—158 **5 Claims**



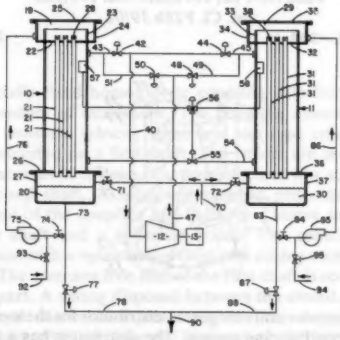
A time delay control circuit for an air conditioning system prevents restarting of the compressor motor until the pressure on the output side of the compressor drops below a fixed value. This arrangement prevents constant recycling of the compressor motor. The control circuit includes a thermostatically operated relay in series with a pair of parallel relays. One of the parallel relays is normally closed and opens whenever pressure on the high side of the compressor reaches a predetermined normal value. The other parallel relay is normally open and closes whenever power is supplied to the compressor motor. The motor power circuit includes a third normally open relay in series with the motor. The third relay is closed whenever the thermostatically operated relay and either of the parallel relays complete the control circuit.

3,745,782

SLUDGE SEPARATION SYSTEMS EMPLOYING REFRIGERATION MEANS

Floyd B. Neyhart, Fayetteville, and James S. Styron, North Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 2, 1972, Ser. No. 231,274
Int. Cl. F25b *29/00*
U.S. Cl. 62—159 **5 Claims**



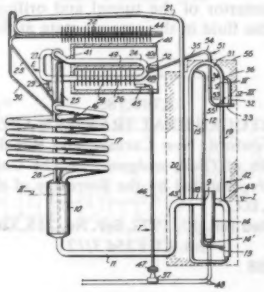
A sludge separation system, particularly of the type for promoting separation of alum sludge from the effluent of a potable water treatment plant, is provided with a pair of identical falling film heat exchangers wherein sludge is distributed to flow down the interior of the heat exchange tubes of one of the heat exchangers and a cooling medium is circulated through the interior of the tubes in the other heat exchanger. A refrigeration system is provided to freeze sludge in the one heat exchanger by evaporating the refrigerant on the exterior of the heat exchange tubes. The evaporated refrigerant is compressed and condensed on the exterior of the tubes in the other heat exchanger. Recirculation means for sludge is provided in order to continuously cool and solidify a thin film of the sludge descending in the heat exchange tubes of the one heat exchanger and a similar recirculation means is provided for recirculating cooling medium through the heat exchange tubes of the other heat exchanger. Periodically the refrigeration system is reversed, utilizing the cooling capacity of the frozen sludge in the heat exchange tubes of the one heat exchanger to condense refrigerant while freezing sludge in the heat exchange tubes of the other heat exchanger. Means are provided to supply the separated liquid component of the sludge as an additional cooling medium in the heat exchanger acting as a refrigerant condenser so that it is unnecessary to provide a separate condenser.

3,745,783

APPARATUS FOR DEFROSTING COOLING UNITS OF ABSORPTION REFRIGERATION SYSTEMS

Wilhelm Georg Kogel, Lidingo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 6, 1971, Ser. No. 187,079
Claims priority, application Sweden, Oct. 8, 1970, 13625/70
Int. Cl. F25b *15/10*
U.S. Cl. 62—278 **10 Claims**



In an hermetically sealed absorption refrigeration system employing an inert gas, refrigerant vapor expelled from solution in a generator by heating is liquefied in a condenser which flows therefrom to an evaporator to produce useful refrigeration. Frost accumulating on the evaporator is melted by such expelled vapor which is at an elevated temperature and flows directly to the evaporator in a by-pass line without passing through the condenser. The by-pass line has a trap in which liquid is collected to prevent flow of refrigerant vapor directly to the evaporator and from which trap liquid is removed from time to time to defrost the evaporator.

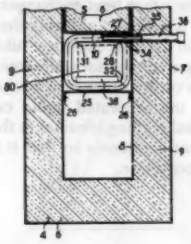
During operation of the refrigeration system the generator is heated intermittently and the system cycles between "on" or active periods and "off" or inactive periods. An important feature of the invention resides in making use of the cycling of the refrigeration system to automatically start defrosting each time an "on"or active period commences following an "off" or inactive period and to automatically terminate such defrosting after an interval of time.

3,745,784

COOLING APPARATUS WITH CONVEYOR

Maurice Caillat, Veurey Voroise, and Georges Perrin, Vizille, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed May 20, 1971, Ser. No. 145,338
Claims priority, application France, May 22, 1970, 7018787
Int. Cl. F25d *25/04*
U.S. Cl. 62—380 4 Claims



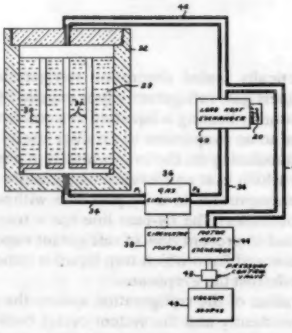
A method of and apparatus for cooling a body which is a bad conductor of heat, the method consisting of displacing the body from the inlet to the outlet of an elongated cooling zone in a current of a cooling fluid in the gaseous state circulating wholly in said zone in the same direction as that of the displacement of the said body, a difference in temperature being maintained at the inlet of the said zone, between said body and said current at least equal to 150°C. The cooling fluid may be nitrogen and the body to be cooled may be made of an elastomer or polymer material. The apparatus comprises a thermally insulated tunnel, an evaporator for the cooling fluid in the liquid form, comprising a conduit in heat exchange relation with the interior of the tunnel and orifices for the introduction of the fluid in the gaseous state at the inlet of the tunnel.

3,745,785

SOLID CRYOGEN HEAT TRANSFER APPARATUS

Jimmie W. Crawford, New Carlisle, and Ronald White, Englewood, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 17, 1972, Ser. No. 218,320
Int. Cl. F25d *3/12*
U.S. Cl. 62—388 1 Claim



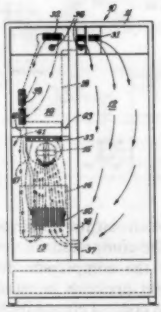
An apparatus for transferring heat from a heat load to a solid cryogen having the solid cryogen in an insulated container. The solid cryogen has a plurality of gas passages therethrough. A gas circulator supplies sublimed gas from the passages in the solid cryogen to heat exchanger adjacent the heat load. A portion of the return gas is supplied to a heat exchanger for the gas circulator motor. The flow in the motor heat exchanger is controlled by the pressure of the gas in the return conduit from the load heat exchanger to the solid cryogen chamber and a pressure control valve connected in the output of the motor heat exchanger.

3,745,786

REFRIGERATION APPARATUS

James P. Laughlin, Evansville, and Wilfred W. McCullough, Evansville, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 1, 1971, Ser. No. 203,555
Int. Cl. F25d *17/06*
U.S. Cl. 62—419 10 Claims



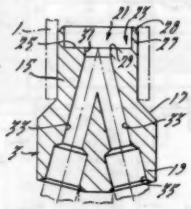
A refrigeration apparatus having means defining a compartment which at least at times is refrigerated to a below-freezing temperature. Air is returned from this compartment to a fin-and-tube evaporator by firstly conducting the air over the tube end turns of the evaporator and then through the passages defined by the evaporator fins to be refrigerated by heat exchange relationship therewith. The compartment may comprise a convertible compartment which, at times, is maintained at an above-freezing temperature and at times is maintained at a below-freezing temperature. The apparatus may further include a refrigerator compartment and a freezer compartment with the air being returned to different portions of the evaporator from the different compartments for improved operation of the refrigeration apparatus.

3,745,787

EVAPORATOR COIL REFRIGERANT DISTRIBUTOR

Louis F. Ponziani, Kettering, Ohio, assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 16, 1971, Ser. No. 199,128
Int. Cl. F25b *39/02*
U.S. Cl. 62—504 2 Claims

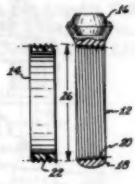


An evaporator coil refrigerant distributor for the evaporator of an air conditioning system. The distributor has a flat face inlet for creating turbulence in the incoming liquid and gaseous refrigerant. The mixture of liquid and gaseous refrigerant must then pass through a central discharge area into a plurality of outlets which are connected to different passages of the evaporator coil.

3,745,788
FINGER RING AND RADIALLY COMPRESSIBLE ADJUSTABLE SIZING DEVICE, AND METHOD OF FITTING A RING

James P. L. Sullivan, P.O. Box 3241, Scottsdale, Ariz.

Filed Nov. 26, 1971, Ser. No. 202,162
Int. Cl. A44c 9/02
U.S. Cl. 63—15.6 7 Claims

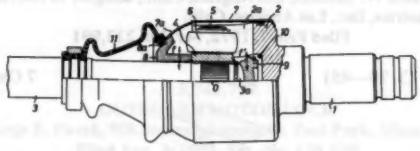


An adjustable device is disclosed for use with a finger ring which permits the wearer to easily size the ring for a comfortable fit. The adjustable device comprises an externally threaded shim which threadably engages the inside periphery of the ring so as to circumferentially compress the shim as the ring is rotated relative thereto.

3,745,789
AXIALLY FIXED HOMOKINETIC COUPLING WITH LIMITED TRANSVERSE FREEDOM OF MOVEMENT

Michel Orain, Conflans-Sainte-Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed Oct. 18, 1971, Ser. No. 190,338
Claims priority, application France, Nov. 6, 1970, 7040066
Int. Cl. F16d 3/30
U.S. Cl. 64—21 4 Claims



An axially fixed homokinetic coupling with limited transverse freedom of movement. The coupling essentially comprises a constant velocity three-arm star-type coupling with rollers mounted on a first shaft. The rollers are mounted for rolling movement in pairs of grooves formed in a socket fixed to a second shaft. A retaining member prevents the axial movement of the coupling and includes a sleeve surrounding the first shaft and a spherical collar. The spherical collar cooperates with a spherical portion of a casing secured to the socket. The concave free end of the first shaft is received in a convex part. A spring disposed between the closed end of the socket and the convex part maintains the convex part in cooperation with the concave free end of the first shaft and maintains the spherical part of the casing is very close overlying relationship with the spherical collar of the retaining member to effect a fluidtight seal therebetween. The assembly enables transverse displacement of the shafts to compensate for slight differences in their alignment.

3,745,790
SLIP CLUTCH

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Co., Inc., Blair, Nebr.

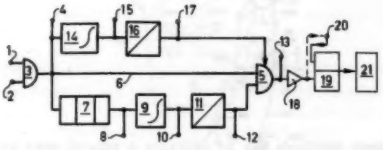
Filed Mar. 8, 1971, Ser. No. 121,783
Int. Cl. F16d 7/04
U.S. Cl. 64—29 13 Claims

1 A clutch, or slip coupling, having an improved spring release means to permit slippage between the driver and driven member under preselected conditions.

3,745,791
CONTROL PULSE SYSTEM FOR KNITTING MACHINES

Claude C. A. Cuche, Neuchatel, Switzerland, assignor to Edouard Dubied et Cie S.A., Neuchatel, Switzerland

Filed Dec. 31, 1970, Ser. No. 103,239
Claims priority, application Switzerland, Jan. 28, 1970, 1194/70
Int. Cl. D04b 15/78
U.S. Cl. 66—50 R 2 Claims



In a knitting machine with electromagnetic selection of the needles, excitation of the electromagnets is controlled by pulses at the revolutions per minute (speed) of the machine. The time constant of the electromagnets at high machine speeds is compensated by shifting the phase of the pulses in accordance with the machine speed. Phase shift at low speeds is unnecessary.

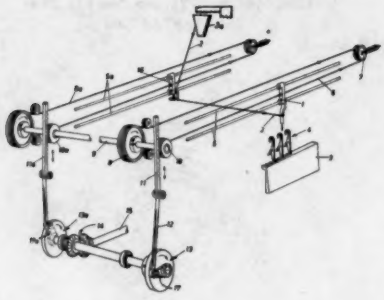
3,745,792
WARP KNITTING MACHINE MECHANISM

Gerhard Bergmann, Hausen, Germany, assignor to Karl Mayer Textilmaschinenfabrik G.m.b.H., Obertshausen, Germany

Filed Dec. 6, 1971, Ser. No. 204,934
Claims priority, application Germany, Dec. 12, 1970, P 20 61 343.8
Int. Cl. D04b 23/00
U.S. Cl. 66—86 4 Claims

The yarn guide of a warp knitting machine is mounted for reciprocation through a first phase wherein the path of the yarn from the fixed supply cone to the yarn guide is shortened and a second phase wherein this path is lengthened. A

mechanism is arranged in this path which comprises a yarn hook mounted for coordinated movement so that a stored



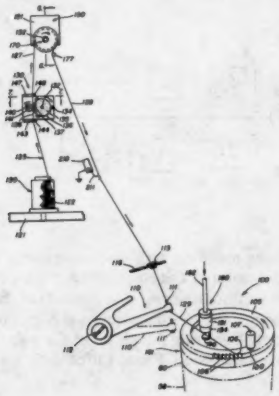
length of the yarn is formed during the first phase and the stored length of yarn disappears during the second phase of the movement.

3,745,793

APPARATUS FOR FEEDING ELASTIC YARN TO CIRCULAR KNITTING MACHINES

Richard H. Heinig, and Omer Bowen, both of Fayetteville, Ark., assignors to Bear Brand Hosiery Co., Chicago, Ill.

Filed Dec. 11, 1970, Ser. No. 97,152
Int. Cl. D04b *15/46, 35/12*
U.S. Cl. 66—146 **4 Claims**



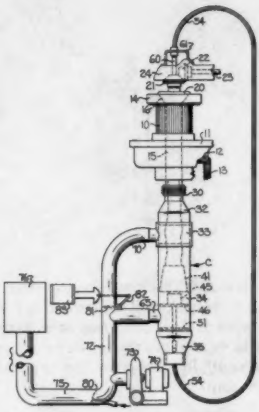
There is disclosed an apparatus for feeding an elastic yarn from a supply package to a knitting station under uniform controlled tension, utilizing a mechanism for pulling the elastic yarn from the supply package at a rate greater than that required by the knitting station to deliver the elastic yarn to a wheel on a hysteresis brake under essentially zero tension, the hysteresis brake applying a constant braking force of predetermined value to place the elastic yarn under a uniform controlled tension as it is fed to the knitting station, a yarn clamp at the knitting station for holding the elastic yarn when there is no demand therefor at the knitting station, and an electrical control to detect the presence of the elastic yarn to shut down the knitting machine in the absence thereof.

3,745,794

APPARATUS FOR PNEUMATICALLY TENSIONING AND COLLECTING CIRCULAR KNIT HOSIERY ARTICLES

Bobby H. Brackett, and Charles A. Jaynes, both of Loudon, Tenn., assignors to Charles H. Bacon Company, Inc., Lenoir City, Tenn.

Filed May 28, 1971, Ser. No. 147,936
Int. Cl. D04b *15/42*
U.S. Cl. 66—149 S **5 Claims**



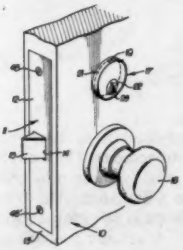
This apparatus is particularly adapted to use with circular hosiery knitting machines and operates to prevent twisting of the hosiery fabric as it is being produced on the knitting machine. The apparatus includes an article retaining chamber with a rotating article support in a medial portion of the retaining chamber and on which the lower portion of the hosiery article is accumulated during the knitting process. Upon completion of the knitting of the article, the article is withdrawn through a vacuum source positioned above the article support and removed to a suitable collection point.

3,745,795

CYLINDER RETENTION MEANS

Vernard W. Sanders, Los Angeles, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.

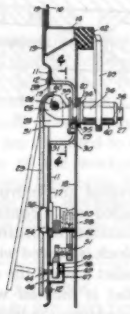
Filed Feb. 7, 1972, Ser. No. 223,991
Int. Cl. E05b *9/08*
U.S. Cl. 70—451 **7 Claims**



A mortise type lock assembly has a case with opposite flat side walls and an end wall defining a chamber. A cylinder assembly has a threaded engagement with respect to one of the opposite side walls. The cylinder assembly has a keyway in a rotatable plug and normally has a mechanism for converting key rotation into, for example, a latch bolt unlocking movement, the mechanism for latch bolt movement being omitted as outside the scope of the invention. A flanged ring anchored in each wall has an internal threaded opening which receives the respective cylinder assembly. Serving the cylinder as-

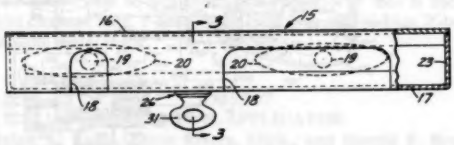
sembly is a special screw, threaded at one end and unthreaded at the other end. There are two spaced brackets, one with a threaded hole and one with a clear hole, center lines of the holes being offset from each other so that each screw, when driven into a slot in the cylinder assembly to releasably lock it in position, is biased causing the threads of the screw to lock in position so that the parts will not work loose during use.

3,745,796
LOCK ASSEMBLY FOR METAL BOX
Robert T. Fleming, Corona Del Mar, Calif., assignor to Fleming Metal Fabricators, Los Angeles, Calif.
Filed Aug. 30, 1971, Ser. No. 176,040
Int. Cl. E05b *5/02, 13/08*
U.S. Cl. 70—81 **1 Claim**



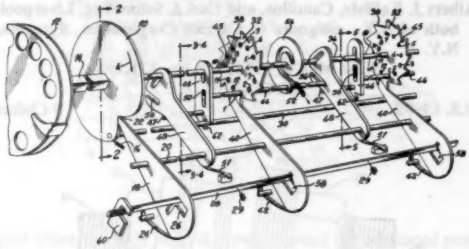
A lock assembly for the hinged door of a metal box employs a pivot bolt with a locking arm, and a handle which is connected to the pivot bolt by means of a transverse pivot pin. The handle is used to swing the locking arm about the axis of the pivot bolt, and the handle may be secured to hold the arm in locked position. This is accomplished by means of an apertured tab near the swinging end of the handle which is engaged by a lock pin actuated by a key-operated mechanism.

3,745,797
OUTBOARD MOTOR LOCK
George E. Pavek, 908 Summit Avenue St. Paul Park, Minn.
Filed Apr. 2, 1971, Ser. No. 130,630
Int. Cl. F16b *41/00*
U.S. Cl. 70—232 **1 Claim**



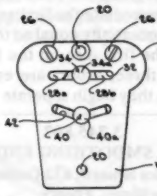
Locking devices for outboard motors which are designed to protect the motor from theft or accidental dislodgement through vibration during operation comprise a body member for snugly receiving the head portions of the motor clamps and a closure member enclosing said head portions within the locking device and integral locking means for locking said body and closure members together.

3,745,798
MULTI-DIGIT DIAL LOCK
George Pieddeloup, 18 Avenue Lefevre, 94 Le Plessis Trevise, France
Filed Nov. 26, 1971, Ser. No. 202,523
Claims priority, application France, Nov. 26, 1970, 7042465
Int. Cl. E05b *37/00*
U.S. Cl. 70—306 **8 Claims**



A multi-digit dial lock comprising a number of toothed wheels corresponding to the number of digits of a code, and means for successively rotating each toothed wheel to a predetermined angular position. When all the toothed wheels are positioned at such predetermined angular position, the lock opens automatically.

3,745,799
KEY CONTAINER
Carl R. Fagiano, 6900 W. Montrose, Chicago, Ill.
Filed Aug. 9, 1971, Ser. No. 170,017
Int. Cl. A47g *29/10*
U.S. Cl. 70—456 R **9 Claims**



A key case having a plurality of slot portions containing pairs of stored key members pivotally movable by selectively operable sliding ejector button members. The button members are positioned in horizontally spaced slot portions to engage only associated key pairs.

3,745,800
RETAINING RING
John H. Zentmyer, 2611 W. Olive Avenue, Apt. 16, Burbank, Calif.
Filed May 28, 1971, Ser. No. 147,902
Int. Cl. A44b *15/00*
U.S. Cl. 70—45 B **2 Claims**

A simple retaining ring suited for selectively holding objects having an aperture, such as keys. A beveled gap is provided

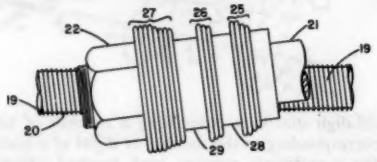
totally through the ring at one point on the periphery. The key is urged into the gap and spreads the ring apart by cam action. The ring is formed of spring material so that one edge of the gap is normally closed. A coating may be applied to the slot of the gap to allow easy opening of the ring upon engagement with a key.

3,745,801

MULTIPLE TUBE FINNING APPARATUS

Albert J. Kallfelz, Camillus, and Carl J. Schmeling, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 2, 1972, Ser. No. 231,295
Int. Cl. B21h *3/12*
U.S. Cl. 72—78 **9 Claims**



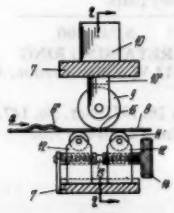
A tool for producing either a two or three lead integral fin structure on thin wall tubing is provided with two or more arbors, each having three groups of finning discs which are spaced from each other by a first and a second spacer. The second group of discs is located between the two spacers and includes a first disc adjacent the first spacer having a diameter of less than the diameter of the last disc on the first group. The second group of discs also includes a last disc adjacent the second spacer having a diameter greater than the diameter of the first disc on the third group adjacent the second spacer. In addition, the second group of discs includes another disc which is disposed intermediate the first and last discs and has a diameter which is substantially equal to that of the last disc on the first group and the first disc on the third group. At least two, and preferably three, arbors are employed and spaced during finning so that they begin separate fin leads.

3,745,802

METHOD FOR SMOOTHING ENDLESS STRIPS

Pierre Adolphe Maurice Senard, 632 Gaston Boulet Bapeaumeles Rouen (Seine Maritime), France

Filed Feb. 8, 1972, Ser. No. 224,448
Claims priority, application France, Feb. 8, 1971, 7104048
Int. Cl. B21d *1/02*
U.S. Cl. 72—164 **9 Claims**



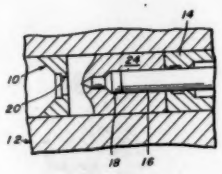
Bumps are smoothed from endless steel strips such as saw blades, by feeding the strip past a smoothing roller of substantially less width than the width of the strip. The strip and the smoothing roller are progressively or stepwise laterally displaced relative to each other, so that a bump is smoothed stepwise. A sensing device moves the smoothing member into the plane of the strip substantially only when the bump is juxtaposed to the smoothing member. The smoothing member can be a thin roller backed on the opposite side of the strip by further rollers of which two can be disposed in the plane of the smoothing roller or four can be spaced in pairs on opposite sides of that plane. In either event, the backup rollers are fore and aft of the smoothing roller equal distances in the direction of movement of the strip, and are simultaneously adjustable toward and away from each other.

3,745,803

METHOD OF EXTRUDING TUBULAR PRODUCTS

Bert V. Livelsberger, Mulberry, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 25, 1971, Ser. No. 174,880
Int. Cl. B21c *23/20*
U.S. Cl. 72—265 **6 Claims**



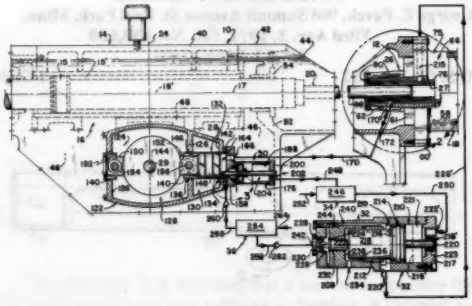
A method is provided for extruding a tubular product wherein a billet is loaded into a container in a press, the billet is restrained in the container by crushing it between a ram and a die block, the die block is moved with respect to the billet so that the end of the billet toward the die block is substantially unrestricted, the billet is pierced with a mandrel, and the pierced billet is extruded over the mandrel and through the extrusion die.

3,745,804

CONTAINER FORMING APPARATUS

Cornelis Langewis, Walnut Creek, and Arthur Dean Smith, San Lorenzo, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 20, 1971, Ser. No. 209,781
Int. Cl. B21d *24/04*
U.S. Cl. 72—349 **10 Claims**

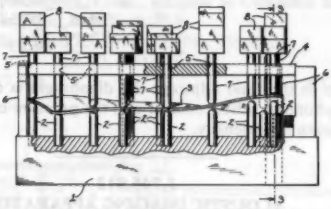


Container forming apparatus provided with an improved sleeve-like element for engaging and precisely orienting a cup-shaped metal workpiece such as one made of aluminum relative to a set of dies during the forward advance of a ram or punch relative to the dies whereby the workpiece can be properly presented and fed to the dies.

3,745,805
CREEP ANNEALING AND A MULTIPLE PIN FIXTURE FOR USE THEREIN

Roland A. Gauthier, South Milwaukee, Wis., assignor to Ladish Co., Cudahy, Wis.

Filed Aug. 27, 1971, Ser. No. 175,502
Int. Cl. B21d 11/00
U.S. Cl. 72—364 9 Claims

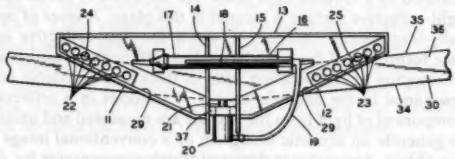


A plurality of fixed support pins extend upwardly from a base in predetermined spaced relation and to individual heights corresponding in composite to the design contour for the lower surface of a workpiece, and a plurality of independent movable pins extend downwardly through individual opening in a holder and are weighted to exert a suitable force upon the upper surface of the workpiece to effect creep therein during a heat anneal time cycle for the workpiece and thereby accurately shape the workpiece according to the predetermined contour in the general plane of the lower side thereof.

3,745,806
PORTABLE HAND TOOL

Kenneth A. Ratfield, 745 East Prairie St., Marengo, Ill.

Filed Sept. 20, 1971, Ser. No. 182,052
Int. Cl. B21d 3/10
U.S. Cl. 72—389 9 Claims



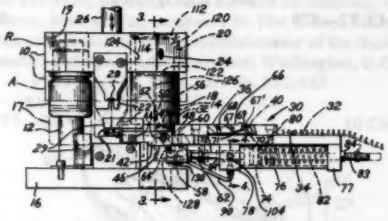
A portable hand tool is disclosed for straightening bent flanges of metal members. A support structure is provided having first and second detent pins adjustably disposed in spaced relationship to each other adjacent one side of said structure, and force applying means is disposed adjacent the opposite side thereof in operative interposition to said detent pins and engageable with one edge of a bent flange while the detent pins engage the other edge thereof and coactable with said detent pins to straighten said flange. The tool is useful with channel bars, T-bars, angle bars, I-beams, H-bars, Z-bars and like metal stock.

3,745,807
TERMINAL APPLICATOR

Ralph A. Vogel, Three Rivers, Mich., and Harold F. Bratt, Columbus, Ohio, assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Jan. 14, 1972, Ser. No. 217,831
Int. Cl. B21d 43/06
U.S. Cl. 72—421 13 Claims

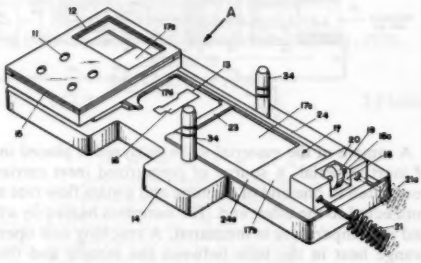
In a power operated press of the type having a slide head which is reciprocal between retracted and advanced positions toward and away from articles being worked upon, an article feed assembly includes a fluid operated feed finger which is moved toward the slide head so as to feed the articles when the slide head is retracted and which is retracted by the introduction of a pressurized gas into a feed cylinder when the slide head is advanced. The pressurized gas, preferably air, is provided by a pumping action effected by the slide head guide post when the slide head is moved toward the advanced position. Once the feeding finger has been fully retracted, it is slowly advanced in the feeding direction independently of the speed at which the slide head is retracted by the action of a bleed orifice which controls the discharge of the pressurized gas from the feed cylinder.



3,745,808
DIE SET HAVING AUTOMATIC FEED BETWEEN SUCCESSIVE STAGES

Yasuhide Hosaka, 411, Kamisckisuizimachi, Kofu-shi, Yamanashi-ken, Japan

Filed June 16, 1970, Ser. No. 46,721
Claims priority, application Japan, June 18, 1969, 44/48165
Int. Cl. B21j 11/00
U.S. Cl. 72—405 18 Claims



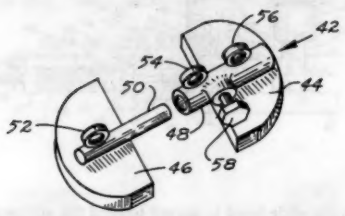
Apparatus for use with an automatic press comprises a single die set having a plurality of stages or dies and punches for progressively forming desired parts. The lower die is provided with means for feeding the parts from one stage to the next at a right angle relative to the direction the strip is fed into the die set in response to each stroke of the press, and means for discharging the finished parts from the last stage. A drawing punch or blank holder is provided with a spring biased pin which is normally extended from a hole in the punch or blank holder and is retracted into the hole when the pin contacts with a blank so that a drawn part ejected out of the die may be held in the horizontal position during raising of the punch, thereby preventing it from overlapping with the next blank fed into the drawing stage. In the final stage, means for discharging the finished parts out of the die set is provided.

3,745,809

APPARATUS FOR REPAIRING DEFORMED YIELDABLE STRUCTURES

Anastacio V. Sanchez, 10775 Foothill Boulevard, Cupertino, Calif.

Division of Ser. No. 14,558, Feb. 26, 1970, Pat. No. 3,673,842.
This application Nov. 26, 1971, Ser. No. 202,130
Int. Cl. B21j *13/02*
U.S. Cl. 72—479 6 Claims



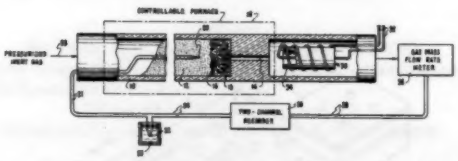
Appratus for repairing vehicle bodies including placing a vehicle body to be repaired within a stall, engaging attachment tools with preshaped contour surfaces to the body about the area to be repaired, joining the tool to tension cable means guided by a select guide means to guide the cable along a desired line of action, and applying tension means to the cable means for placing the cable in tension at adjustable magnitudes along said line of action.

3,745,810

APPARATUS FOR MEASURING THE RATE AT WHICH VAPORS ARE EVOLVED FROM MATERIALS DURING THERMAL DEGRADATION

Robert J. McCarter, Derwood, Md., assignor to The United States of America as represented by The Secretary of Commerce

Filed Sept. 3, 1971, Ser. No. 177,725
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 R 8 Claims



A sample of the material to be analyzed is placed in a tube of inert material. A source of pressurized inert carrier gas is connected to one end of the tube and a mass flow rate meter is connected to the other end. The sample is heated by a furnace and its temperature is measured. A cracking coil operated at orange heat in the tube between the sample and the meter cracks any condensable or tarry vapors evolved from the sample. This prevents any vapors that otherwise might condense in conduit lines from fouling the apparatus, and from failing to be included in measurements of the vapor mass flow rate.

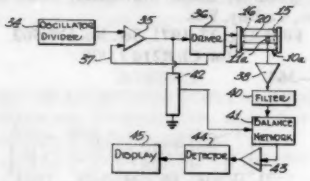
3,745,811

FLUID DENSITY GAUGE

John D. Dure, Henshaw, Ontario, and Charles H. Henshaw, Ottawa, Ontario, both of Canada, assignors to Computing Devices of Canada Limited, Ottawa, Ontario, Canada

Filed Aug. 27, 1970, Ser. No. 67,439
Int. Cl. G01n *9/00*
U.S. Cl. 73—30 9 Claims

An apparatus for determining fluid density by accelerating the fluid and detecting pressure changes caused by the inertia of the fluid. A fluid is introduced into a chamber of constant volume and the fluid caused to accelerate by a diaphragm which in practice vibrates back and forth. The pressure



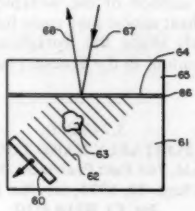
change in the fluid adjacent the diaphragm is detected by a microphone or other receiver and the pressure change is used to indicate fluid density.

3,745,812

ACOUSTIC IMAGING APPARATUS

Adrianus Korpel, Prospect Heights, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed July 7, 1971, Ser. No. 160,285
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.5 R 17 Claims



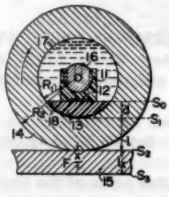
An object is irradiated with acoustic waves to develop a field of acoustic vibrations in a selected plane which is scanned by a focused light beam. An acoustically-perturbable light-reflective surface is located in this plane. A layer of optically-transparent material, of which the light-reflective surface forms one of the boundaries, has sufficient acoustic-wave attenuation in combination with its thickness to exhibit nonresonance to the acoustic energy. Variations in a reflection component of light from the surface are measured and utilized to generate an acoustic hologram or a conventional image of the object. Apparatus is depicted which compensates for differential attenuation of acoustic waves in a sound-propagative medium holding an object being irradiated.

3,745,813

ULTRASONIC INSPECTION ROLL SYSTEM

Sutekiyo Uozumi, Tokyo, Japan, assignor to Electronics Research Co. Ltd., Kanagawa Perfecture, Japan

Filed Apr. 7, 1971, Ser. No. 132,069
Claims priority, application Japan, Apr. 18, 1970, 45/32763
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 4 Claims



In a roll system for ultrasonic inspection of steel plates or other materials using a double temperature gradient delay

line, a predetermined safety zone is provided against possible wear of the delay line materials. The first delay line material in the roll assembly is so constructed as to serve as an acoustic beam lens through which inputs and outputs of transducers are switched at a high speed cycle.

3,745,814

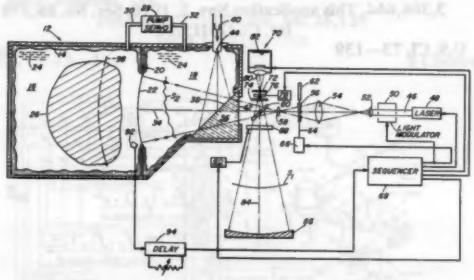
SONORADIOGRAPHY SYSTEM

Dennis Gabor, Stamford, Conn., assignor to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Sept. 13, 1971, Ser. No. 179,915

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 H **6 Claims**



A system for probing a body with ultrasonic radiation and for converting the resulting radiation pattern into a visually perceptible image through the interaction of the ultrasonic radiation and coherent light at a reflecting membrane. To provide sufficient reflection at the interface for optical detection, a short, sharp pressure impulse is directed through a fluid medium to the body under investigation where its interaction produces ultrasound waves that cause deformations of the membrane. Modulated, coherent light is directed toward the membrane interface to produce the appearance of Fresnel zones on the membrane from the ultrasound waves which strike it. Light reflected from the membrane is received by a camera which produces a photographic exposure that can be later viewed by holographic techniques. Small deformations of the membrane are made visible by a schlieren stop which is made highly efficient by a correcting hologram that compensates for imperfections in the shape of the membrane.

3,745,815

DEVICE FOR EVALUATING THE VIBRATIONS OF A REVOLVING MEMBER

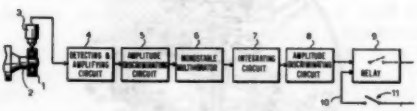
Pier Felice Bentone; Pier Giorgio Golzio, and Vincenzo Vrola, all of Turin, Italy, assignors to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

Filed Oct. 5, 1971, Ser. No. 186,287

Claims priority, application Italy, Oct. 17, 1970, 70460 A/70

Int. Cl. G01h *1/08*

U.S. Cl. 73—71.4 **4 Claims**



A device for evaluating the vibrations of a revolving member comprises a detecting head for detecting the vibrations and their amplitude, an integrating circuit actuated by a monostable multivibrator that generates a pulse in correspondence with each detected vibrations, and an amplitude discriminating circuit whose threshold value is such as to emit a signal only when a signal received thereby from the integrating circuit has an amplitude corresponding to the sum of a plurality of those pulses.

3,745,816

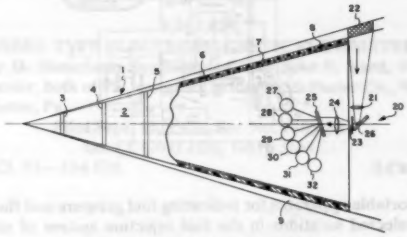
ABLATION ARTICLE AND METHOD

Wayne D. Erickson, Hampton, and Edward M. Sullivan, Newport News, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 20, 1971, Ser. No. 182,033

Int. Cl. G01n *17/00, 19/06*

U.S. Cl. 73—86 **10 Claims**



An ablation article, such as a conical heat shield, having an ablating surface is provided with at elast one discrete area of at least one seed material, such as aluminum. When subjected to ablation conditions, the seed material is ablated. Radiation emanating from the ablated seed material is detected to analyze ablation effects without disturbing the ablation surface. By providing different seed materials having different radiation characteristics, the ablating effects on various areas of the ablating surface can be analyzed under any prevailing ablation conditions. The ablating article can be provided with means for detecting the radiation characteristics of the ablated seed material to provide a self-contained analysis unit.

3,745,817

ENGINE TEST METHOD AND APPARATUS

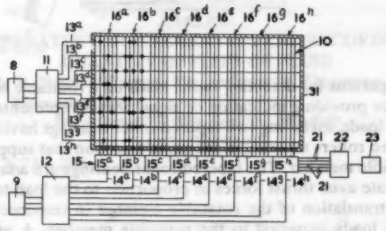
Malcolm Williams, Solihull, and Duncan Barry Hodgson, Whitnash, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 9, 1971, Ser. No. 196,954

Claims priority, application Great Britain, Nov. 11, 1970, 53546/70

Int. Cl. G01m *15/00*

U.S. Cl. 73—117.3 **2 Claims**

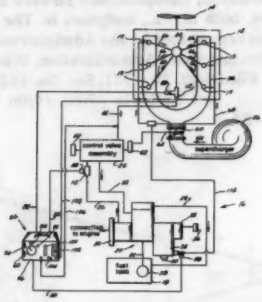


An engine is tested by deriving a first digital signal representative of a first engine parameter and a second digital signal representative of a second engine parameter. These signals provide inputs to a semi-conductor matrix which produces a digital output signal determined by the values of the input signals, the output signal being used to control an engine characteristic. The selections within the matrix are chosen for each combination of input signal so that for each combination of input signals, the output signal exercises the required control of the engine characteristic.

3,745,818
PORTABLE APPARATUS FOR TESTING FUEL INJECTION ENGINES

Carl W. Gaenzler, 29300 Goddard Road, Romulus, Mich.

Filed July 21, 1971, Ser. No. 164,648
Int. Cl. G01m 15/00
U.S. Cl. 73—119 A 9 Claims

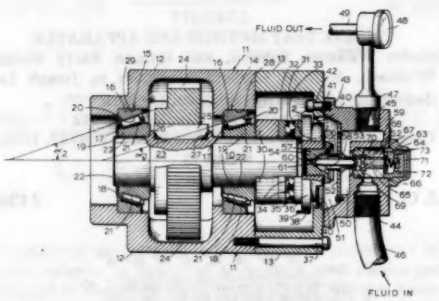


Portable apparatus for indicating fuel pressure and flow rate in selected locations in the fuel injection system of either a naturally aspirated or a supercharged engine while it is being operated on a parked vehicle in order to diagnose the condition of each fuel injection component.

3,745,819
LOAD INDICATING APPARATUS

Webster B. Earl, Pfafftown, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Dec. 8, 1911, Ser. No. 205,935
Int. Cl. G01l 5/00
U.S. Cl. 73—133 R 10 Claims

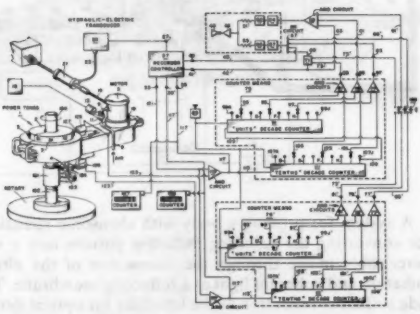


Apparatus for detecting radial loads on a rotatable member and for providing indication or signal that is representative of these loads, including two tapered roller bearings having their tapered rollers tapering in the same direction that support the rotatable member. The tapered roller bearings are adapted to generate axial thrust forces in proportion to the load to cause axial translation of the rotatable member in response to the radial loads imparted to the rotatable member. A piston is located adjacent to one end of the rotatable member and is adapted to move axially in response to axial translation of the rotatable member. A flexible diaphragm is operatively connected to the piston and the flexible diaphragm forms a part of a variable fluid pressure chamber that is adapted to receive pressurized fluid from an external source through a fluid pressure regulating system which includes a valve member operably connected to the piston and the flexible diaphragm that introduces fluid into the pressure chamber in proportion to the axial thrust developed by the tapered roller bearings in response to the radial loads being exerted upon the rotatable member. The fluid pressure in the chamber is thus regulated by the axial movement of the rotatable member resulting from the radial loads imposed on the rotatable member and this enables the flexible diaphragm and rotatable member to assume an equilibrium or balanced operating position. A fluid pressure gauge is operatively connected to the pressure chamber to provide an indication of the pressure within the pressure chamber and thus an indication of the amount of the radial load imposed on the rotatable member.

3,745,820
LEAK-PROOF, THREADED CONNECTIONS

Peter D. Weiner, Bryan, Tex., assignor to Esso Production Research Company, Houston, Tex.

Division of Ser. No. 813,573, April 4, 1969, Pat. No. 3,306,664. This application Nov. 2, 1970, Ser. No. 86,370
Int. Cl. G01l 5/21
U.S. Cl. 73—139 5 Claims

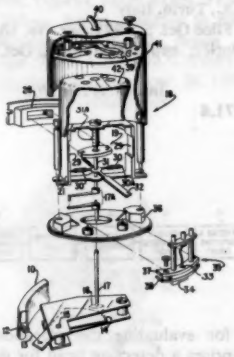


Method and apparatus for obtaining leak-proof threaded pipe connections for either double-end makeup or single-end makeup. In each instance, one pipe section is rotated and the torque required for such rotation is measured and the number of turns of the rotated pipe section are counted. The number of turns of the coupling are also counted in double-end makeup. Signals indicative of such torques and turns are fed to apparatus for control of connection makeup.

3,745,821
TORQUE TO ELECTRICAL CURRENT TRANSDUCER

Charles E. Keenan, Perkasie, and William A. Power, Willow Grove, both of Pa., assignors to Ametek, Inc., New York, N.Y.

Filed Sept. 30, 1970, Ser. No. 76,881
Int. Cl. G01l 1/08
U.S. Cl. 73—141 R 6 Claims



An electrical current transducer or transmitter having a meter movement with magnet means movable both by input

torque directly to its shaft and by feedback current through stationary coils adjacent to the magnet, a vane mounted on the movement controlling radiant energy, and an energy sensitive means to produce a current level proportional to input displacement of the meter movement. The transducer comprises the output means of several electrical transmitters whose input means proportions the measured condition to torque for actuation of the transducer.

3,745,822

APPARATUS FOR DETERMINING TEMPERATURE DISTRIBUTION AROUND A WELL

Aaron E. Pierce; Jerry G. Hillestad; Arthur G. Spillette; Claude E. Cooke, Jr., and William A. Burns, Jr., all of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Apr. 2, 1970, Ser. No. 25,139
Int. Cl. E21b *47/06*
U.S. Cl. 73—154 5 Claims

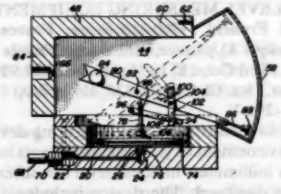
This application discloses methods and apparatus for making temperature measurements around the circumference of a well to determine the presence and orientation of temperature gradients existing in the well. The preferred embodiment of the apparatus includes a temperature sensor assembly having multiple temperature probes which contact the well at points on its circumference and measure the differential temperature between these locations. The apparatus also includes a rotator assembly for moving the temperature sensor about its vertical axis for additional, subsequent temperature measurements. The apparatus further includes an orientation device for determining the direction or azimuth of the locations at which the differential temperature measurements are made.

3,745,823

AIR SPEED INDICATOR

Cecil M. Hunter, P. O. Box 602, Sun City, Ariz.

Filed Dec. 22, 1971, Ser. No. 117,406
Int. Cl. G01p *5/16*; G01l *7/06*
U.S. Cl. 73—182 4 Claims



A pitot tube connected, bellows actuated and temperature corrected air speed indicator including a linear upstanding readout scale. The indicator includes adjustments whereby the calibration of the indicator may be readily altered in order to increase or decrease the increments spread throughout a given range of increments on the read-out scale of the indicator.

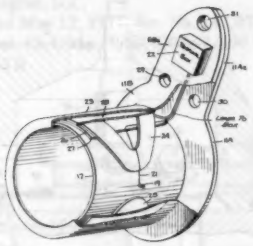
The air speed indicator has been specifically designed with a vertical read-out scale. Further the indicator includes an indicator actuating mechanism which is simple in design and therefore more durable and dependable. Also, each of the two forms of the indicators specifically illustrated and disclosed hereinafter include automatic temperature compensating means and the indicator, by being provided with a linear read-out scale, is designed to be utilized in close proximity to other aircraft instruments of the new types including vertical read-out scales.

3,745,824

INSERT-TYPE ELECTROMAGNETIC FLOWMETER

Elmer D. Mannherz, Southampton, and John S. Yard, Warminster, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Sept. 14, 1971, Ser. No. 180,430
Int. Cl. G01f *1/00*; G01p *5/08*
U.S. Cl. 73—194 EM 8 Claims



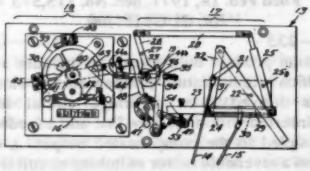
An electromagnetic flowmeter which is insertable within a pipe line conducting a fluid whose flow rate is to be measured. The flowmeter includes a flow-tube assembly of small radial thickness constituted by concentrically-arranged inner and outer tubes defining an annular region. This region is occupied by an electrostatic shield, a pair of oppositely-disposed flat coils contoured to conform to the curvature of the inner tube to establish a magnetic field in a direction mutually perpendicular to the longitudinal axis of the inner tube and to the axis of the electrodes installed thereon, and a magnetic shell surrounding the coils. The remaining space in the region is filled with a potting compound to seal the components therein.

3,745,825

APPARATUS FOR INTEGRATING AND RECORDING QUANTITY OF FLOW OF FLUID

Claude B. Nolte, Villanova, Pa., assignor to Kingmann-White, Inc., Placentia, Calif.

Filed Oct. 13, 1971, Ser. No. 188,947
Int. Cl. G01l *1/02*
U.S. Cl. 73—206 5 Claims



Apparatus for integrating and recording total quantity of flow through a pipe line including a lever system which is

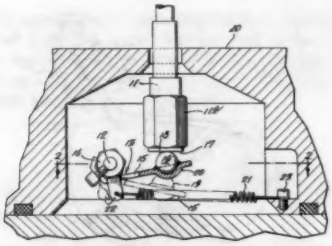
caused to move in accordance with a first input of movement from a measurement of the static pressure within the pipe line and a second input of movement from a measurement of the differential pressure across a meter orifice within the pipe line. The two input of movements are multiplied by each other by the lever system providing a single output of movement which is registered on a cumulative counter that in turn indicates total quantity of flow through the pipe line over a period of time. When either the measurement of static pressure is zero or measurement of the differential pressure is zero, the lever system will not provide an output of movement to the cumulative counter. Additionally, when the measurement of differential pressure is zero a positive lock is provided to prevent registration of flow by the cumulative counter.

3,745,826

DIFFERENTIAL PRESSURE FLOW METERS

George F. Younger, Placentia, Calif., assignor to Kingmann-White, Inc., Placentia, Calif.

Filed June 14, 1971, Ser. No. 152,741
Int. Cl. G01f *1/00*
U.S. Cl. 73—211 **2 Claims**



A bellows-type flow meter operating in conjunction with an orifice plate in a conduit to sense the pressure differential across the plate and to convert the sensed pressure into angular displacement of an output shaft connected to recording instrumentation is provided with an improved linkage mechanism which operates accurately to couple the meter with readout apparatus normally used in conjunction with conventional manometer-type meters. The linkage includes an arm mounted to the output shaft and carrying adjacent its terminus a hemisphere which is biased upwardly by a spring into engagement with a flat surface provided on the bottom end of a rod connected to the bellows. The hemisphere slides relative to the rod surface upon axial displacement of the rod to cause the angular displacement of the shaft to correspond with the angular displacement of the output shaft in flow meters of the manometer type throughout the measurement range of the meter.

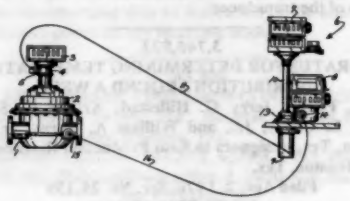
3,745,827

TEMPERATURE COMPENSATION OF A LIQUID FLOWMETER

Philip E. Swanson, Erie, Pa., and Charles J. Tur, Mequon, Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Feb. 16, 1971, Ser. No. 115,573
Int. Cl. G01f *1/00*
U.S. Cl. 73—233 **8 Claims**

A petroleum product bulk plant line includes a flowmeter recorder which is temperature compensated by electrical control signals derived from a bridge circuit including a thermistor inserted within the flow line and a feedback potentiometer coupled to the compensated output. A differential amplifier and a reversible motor switching circuit is connected to the bridge circuit to selectively energize a motor and control an adjustable ratio drive assembly to provide a compensated output to the recorder. An electro-mechanical signal converter is coupled to the flowmeter and generates an electrical signal which is transmitted to a remotely located monitor having a drive assembly and a remotely located recorder. The thermistor within the flow line therefore provides a temperature responsive signal to the remotely located monitor to temperature compensate the drive assembly. The adjustable ratio drive assembly may include a non-linear cam to compensate for changes in the liquid coefficient of expansion.

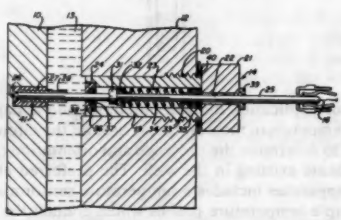


3,745,828

TEMPERATURE-SENSING DEVICE FOR CONTINUOUS-CASTING MOLDS

William E. Howell, Monroeville Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1972, Ser. No. 224,863
Int. Cl. G01f *23/22*; G01k *7/08*
U.S. Cl. 73—295 **5 Claims**



An improved temperature-sensing device for use in a mechanism which locates the level of liquid in a continuous casting mold. The device includes probes which are spring-urged into contact with the inner wall of the mold, as shown in an earlier application. The features of improvement are (1) that the springs are encased out of contact with the cooling water, whereby sediment in the water cannot jam them, and (2) the points on the probes are covered with a sealant, whereby impurities in the water do not precipitate on them.

3,745,829

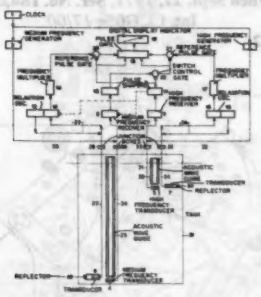
LEVEL MEASURING EQUIPMENTS

Pierre Paul Franchi, Vitry-sur-Seine, France, assignor to L'Electronique Appliquee, Montrouge, France

Filed Oct. 18, 1971, Ser. No. 189,917
Int. Cl. G01f *23/28*; H01v *7/00*
U.S. Cl. 73—290 V **7 Claims**

An electroacoustic liquid level measuring device useful in a cryogenic environment to yield measurements having an accuracy of a few millimeters in liquid level measurements of 20 or 30 meters is disclosed. The device includes a pair of electroacoustic transducers located at different levels in a tank. The transducers both drive a digital read out indicator through a gating arrangement which is effective to cause the indicator

to be activated only by one of the transducers at a time depending on the level of liquid in the tank. The gating arrangement is also effective to compensate for differences in the velocity of sound in the liquid due to temperature variations.

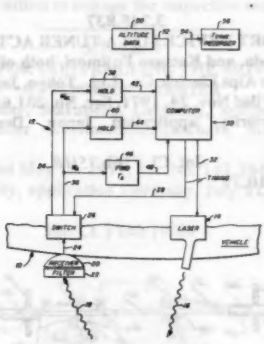


3,745,830

REMOTE SURFACE TEMPERATURE DETERMINATION

Rossman W. Smith, Jr., Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed July 13, 1971, Ser. No. 162,162
Int. Cl. G01j *5/02*
U.S. Cl. 73—344 **11 Claims**



Method and apparatus for making remote surface temperature surveys of the earth, as from aircraft, wherein the emissivity error is eliminated by use of a laser which is pulsed on and off to permit determination of earth reflectivity and hence a value for its emissivity. Apparent measured temperature is then corrected to true temperature using this value of emissivity.

3,745,831

DISPOSABLE THERMOMETER

Edwin C. Rothstein, Flushing, and Bruce Ravdin, Stony Brook, both of N.Y., assignors to Life Technology Corp., Flushing, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,176
Int. Cl. G01k *5/10, 5/22*
U.S. Cl. 73—371 **14 Claims**

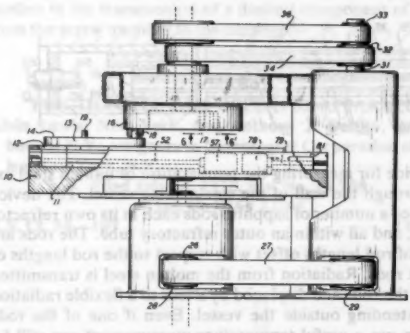
A disposable thermometer including a base member having a reservoir containing a heat-sensitive indicator liquid maintained by a seal, a stem member having a capillary longitudinally disposed therein in registry with a temperature scale on its outer surface, and a rupturing means. The base member and stem member are constructed so that the seal may be broken by the rupturing means, thereby allowing the indicator liquid in the reservoir to expand into the capillary channel to register various temperatures when desired.

3,745,832

LINK-TYPE HYPERSONIC CENTRIFUGE

Allen M. L. Johnson, Succasunna, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 13, 1971, Ser. No. 143,073
Int. Cl. G01n *19/00*; G01p *21/00*
U.S. Cl. 73—432 R **4 Claims**



A centrifuge is disclosed for subjecting items under test forces similar to those encountered in ballistic flight. The centrifuge includes a controlled crank arm which alters the radial position of the sample under test while the centrifuge is rotating to therefore increase or decrease the forces thereon. Details of the crank arm mechanism and counterweight and balance systems are also disclosed.

3,745,833

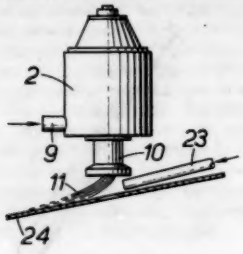
THICKNESS GAUGE

David Alun Armstrong, Glamorgan, Wales, assignor to British Steel Corporation, London, England

Filed July 26, 1971, Ser. No. 165,889
Claims priority, application Great Britain, Aug. 5, 1970, 37,821/70
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 R **8 Claims**

In order to measure the position of a workpiece surface a laminar stream of fluid is projected through a datum point and towards the surface, and the distance through the fluid between the surface and the datum point is measured by determining the time for ultrasonic energy to be transmitted from the datum point to the surface and reflected back to the datum point. Knowledge of the position of the datum point gives the position of the workpiece surface. When no position measurement is required the stream of fluid is deflected from the workpiece surface to avoid the fluid adversely affecting

the workpiece; for example, if the workpiece is a hot steel slab undesirable local cooling by the fluid is avoided. Several mea-



surements can give information on workpiece thickness, profile or cross-section relevant to later manufacturing stages.

3,745,834

DEVICE FOR MEASURING TEMPERATURE OF MOLTEN METAL

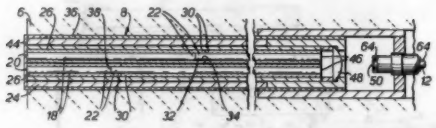
Stanislaw Marian Veltze, London S.W. 7, and Paul Everitt English, Horsham, both of England, assignors to The British Iron and Steel Research Association, London, England

Filed Jan. 19, 1972, Ser. No. 219,109

Claims priority, application Great Britain, Feb. 5, 1971, 4,036/71

Int. Cl. G01j *5/08;* **G01k** *1/16*

U.S. Cl. 73—343 R **9 Claims**



A device for measuring the temperature of molten steel extends through the wall of the steelmaking vessel. The device consists of a number of sapphire rods each in its own refractory tubes, and all within an outer refractory tube. The rods are formed of rod lengths offset with respect to the rod lengths of adjacent rods. Radiation from the molten steel is transmitted through the rods and displaced by a lens to a flexible radiation guide extending outside the vessel. Even if one of the rods cracks in use a useful temperature measurement can still be obtained by analysing the radiation in a ratio pyrometer.

3,745,835

AIR STATIC PRESSURE AND TEMPERATURE MEASURING DEVICE FOR REMOTE LOCATIONS IN STORED POROUS MATERIAL

Lloyd L. Smith, Leland, Miss., assignor to The United States of America as represented by the Secretary of Agriculture

Filed Nov. 1, 1971, Ser. No. 194,363

Int. Cl. G01l *13/00;* **G01k** *7/04*

U.S. Cl. 73—345 **4 Claims**

Device for use in measuring positive or negative air static pressure and temperature at remote locations within a mass of porous material more easily and precisely with one probing of the device.

3,745,836

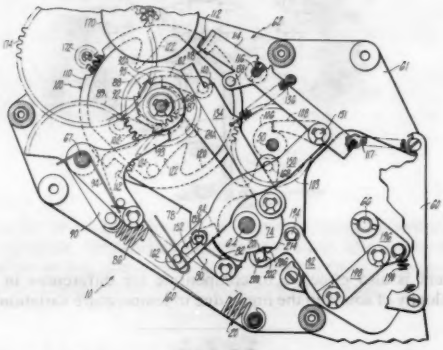
FUEL PUMP REGISTER RESET MECHANISM

Richard L. Seitz, Tolland, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sept. 27, 1971, Ser. No. 184,099

Int. Cl. G05g *17/00*

U.S. Cl. 74—2 **8 Claims**



Fuel delivery apparatus having a resettable register and a delivery register reset mechanism manually operable after the completion of each fuel delivery for deactivating the apparatus and loading a reset spring and manually operable at the beginning of each fuel delivery for resetting the delivery register with the reset spring and, upon completion of the reset phase, reactivating the delivery apparatus for delivering fuel.

3,745,837

SUPPORT DEVICE FOR A TUNER ACTUATOR

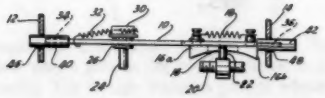
Akihisa Sawada, and Katsuzo Fujimori, both of Tokyo, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1971, Ser. No. 201,653

Claims priority, application Japan, Dec. 29, 1970, 45/138065

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.39 **9 Claims**



A tuner has a slidable actuator that upon movement varies the electrical value of a component. The actuator has at each of its ends at least one arm extending therefrom. A pair of hollow tubular sleeves having smooth outer surfaces are disposed on said arms respectively and are received in a pair of guides so that the actuator can smoothly slide with a high degree of accuracy. Preferably, the sleeves are seamless and are made of brass.

3,745,838

RECIPROCATING DRIVE MECHANISM

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich.

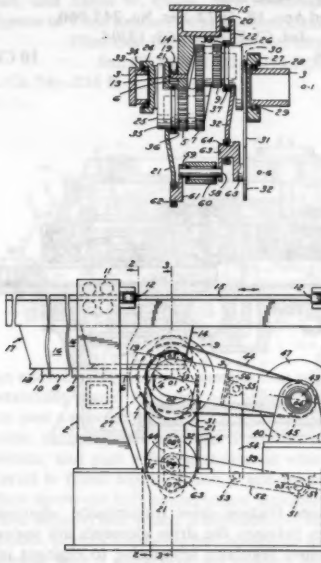
Filed Dec. 23, 1971, Ser. No. 211,263

Int. Cl. F16h *21/02*

U.S. Cl. 74—27 **5 Claims**

A mechanism for achieving a controlled motion in a path of travel which includes a carrier mounted to move in the determined path, a plurality of racks on the carrier extending in the direction of the path, and a plurality of gears to engage said racks selectively and consecutively to drive the carrier, one of

the gears being mounted to rotate on a first axis while the others simultaneously revolve about the first axis, there being



means to mount the gears such that the axis can move generally transversely of the path of travel while maintaining the gears in a position to engage the respective racks.

3,745,839

APPARATUS FOR CONTROLLING THE MOVEMENT OF A PROGRAM CARRIER

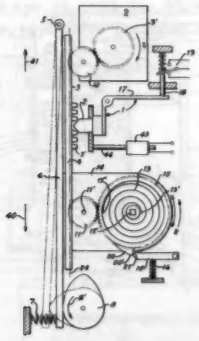
Rudolf Ramstetter, Starnberg, Germany, assignor to Firma Otto Ramstetter Kommanditgesellschaft, Munich, Germany

Filed May 11, 1971, Ser. No. 142,184

Claims priority, application Germany, July 11, 1970, P 20 34 516.8

Int. Cl. F16h *19/04*

U.S. Cl. 74—30 **17 Claims**



The present program carrier control apparatus comprises a power storing and releasing device such as a spiral spring, which is arranged to be cocked in response to driving the program carrier in a forward direction past a sensing station. When the program carrier reaches a predetermined forward position, the energy stored in the storing device is instantaneously released for rapidly returning the program carrier into a starting position.

3,745,840

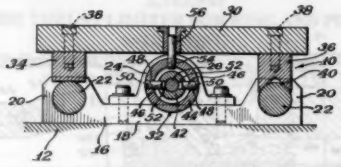
MOTION TRANSMITTING DEVICE

Sidney A. Guralnick, Chicago, Ill., assignor to Traveling Nut Corporation, Chicago, Ill.

Filed June 3, 1971, Ser. No. 149,469

Int. Cl. F16h *27/02*

U.S. Cl. 74—89.15 **7 Claims**



A device for transmitting motion in one preselected direction only for use with machine tools. The device includes a first machine element, such as a tool carriage, to be moved in one preselected direction. A rotating screw member is provided for causing translational movement of the carriage in the one preselected direction. Means interconnect the platform and the rotating screw, the interconnecting means including means which transmit only one degree of movement from the screw to the carriage. The interconnecting means effectively isolates the transmission of undesired components of motion in the transmission of a desired component of motion from the screw member to the carriage.

3,745,841

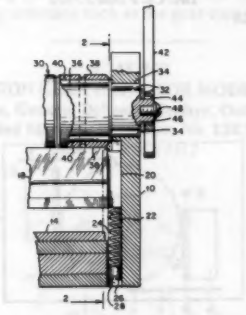
FRICTIONLESS CAM-OPERATED APPARATUS

Alvin Lewis, New York, and Anthony J. Destito, Brooklyn, both of N.Y., assignors to Embosograf Corporation of America, New York, N.Y.

Filed July 14, 1970, Ser. No. 54,758

Int. Cl. F16h *21/44*

U.S. Cl. 74—107 **11 Claims**



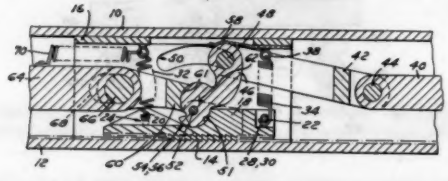
A cam-operated mechanism wherein frictionless roller bearing means are provided between an eccentric cam member and a reciprocating member driven thereby. The cam and reciprocating member are described in particular application to an embossing press or the like, wherein an eccentrically mounted roller is maintained in contact with a vertically movable stamping plate. Roller bearing means are provided surrounding the eccentric roller and interposed between the roller and the stamping plate, whereby the eccentric roller is free to rotate within the roller bearing means, which bearing means are given a substantially frictionless rocking or rolling motion upon the vertically movable stamping plate.

3,745,842

FORCE TRANSFERRING AND MULTIPLYING SYSTEM

John Henry Brems, 32867 White Oaks Trail, Birmingham, Mich.

Filed Nov. 2, 1971, Ser. No. 194,928
Int. Cl. F16h 21/44
U.S. Cl. 74—110 12 Claims



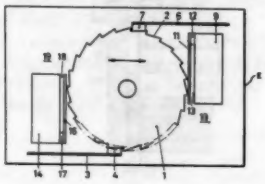
A lineal motion and force transmitting mechanism which will transmit motion directly until a predetermined resistance is met at which time a force multiplying action takes place to increase the output force over the input force, this being accomplished by a lever and linkage assembly with a moving lever fulcrum which is arrested in its motion upon meeting resistance. This allows the incorporated lever to function to produce the mechanical advantage of the particular lever system.

3,745,843

MOTION TRANSFORMER

Max Hetzel, Bienne, Switzerland, assignor to Omega Louis Brandt Et Freres S.A., Bienne, Switzerland

Filed Apr. 14, 1972, Ser. No. 244,053
Claims priority, application Switzerland, Apr. 16, 1971, 6126/71
Int. Cl. F16h 27/02
U.S. Cl. 74—128 8 Claims



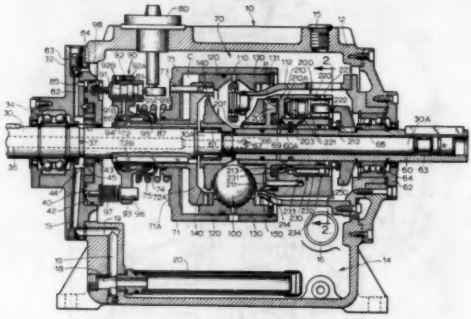
In a motion transformer for converting oscillatory to rotary motion, comprising a ratchet wheel mounted for back-and-forth oscillation on a diameter and simultaneously for rotation substantially about its center, stops for limiting the amplitude of the oscillatory motion, and pawls engaging the ratchet wheel teeth at diametrically opposite points substantially normal to the direction of oscillatory motion, shock absorbing braking members are provided on the stops in position to abut the teeth of the ratchet wheel as it approaches each end of its oscillatory path of travel to brake each oscillation gently without injury to the ratchet wheel teeth.

3,745,844

VARIABLE SPEED DRIVE TRANSMISSION

Henry Schottler, North Riverside, Ill., assignor to Roller Gear, Ltd., Zug, Zug, Switzerland

Filed Apr. 18, 1972, Ser. No. 245,060
Int. Cl. F16h 15/08, 13/04
U.S. Cl. 74—198 10 Claims



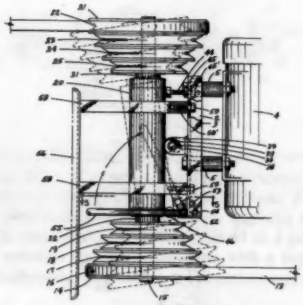
A variable speed friction drive transmission wherein the contact pressures between the drive elements are varied by means of a pressure regulator responsive to changes in the slippage between the drive elements and the torque load on the driven shaft.

3,745,845

SPEED CHANGER

George L. Redman, 335 Church St., East Alton, Ill.

Filed Nov. 17, 1971, Ser. No. 199,617
Int. Cl. F16h 9/06, 7/10
U.S. Cl. 74—217 S 5 Claims

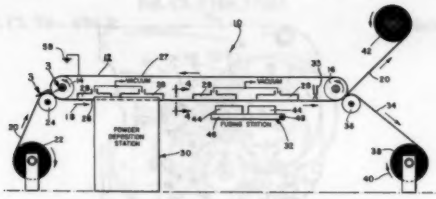


For use with machine tools having a prime mover with a drive shaft and a drive pulley mounted thereon and a driven shaft mounting a tool and having a driven pulley thereon, a speed changer comprising an intermediate shaft disposed between the said drive shaft and driven shaft and being adapted for rockable movement with respect thereto but within the same plane; pulleys carried on each end of said shaft with means respectively engaging same to said drive pulley and said driven pulley.

3,745,846
CONVEYOR BELT CONSTRUCTION

Lennox Birckhead, Jr., Rowayton; Charles P. Evans, Trumbull, and Alden W. Olsen, New Milford, all of Conn., assignors to Vitek Research Corporation, Stamford, Conn.

Filed Oct. 14, 1971, Ser. No. 189,265
Int. Cl. F16g 1/00; B29h 7/22
U.S. Cl. 74—231 R 8 Claims

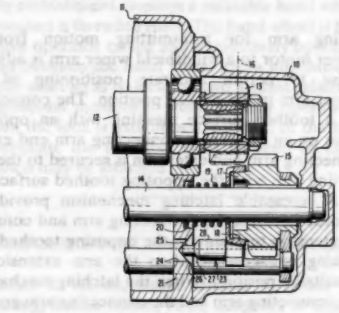


An endless conveyor belt construction adapted to support a substantially planar substrate and adapted to convey the substrate past a powder deposition station at which a layer of particulate, thermoplastic material is applied to a surface of the substrate; and past a fusing station at which the particulate material is fused together into a self-supporting sheet. The endless conveyor belt construction includes a thermally conductive support belt which is substantially rigid under tension; a flexible, porous insulating pad having an inner surface in engagement with a surface of the support belt, and having an outer exposed surface adapted to receive the substantially planar substrate thereon; and transversely spaced elongate sealing means secured adjacent side margins of the support belt and having inner surfaces normally disposed in overlying relationship with side regions of the exposed surface of the insulating pad. Vacuum passages extend through the thermally conductive support belt in communication with the flexible, porous insulating pad.

3,745,847
INSTALLATION FOR ENGAGING A REVERSE-SPEED GEAR WHEEL IN MOTOR VEHICLE CHANGE-SPEED TRANSMISSIONS

Gunter Worner, Rommelshausen, and Peter Schrape, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 16, 1971, Ser. No. 134,644
Claims priority, application Germany, Apr. 17, 1970, P 20 18 399.7
Int. Cl. F16h 3/38
U.S. Cl. 74—339 16 Claims

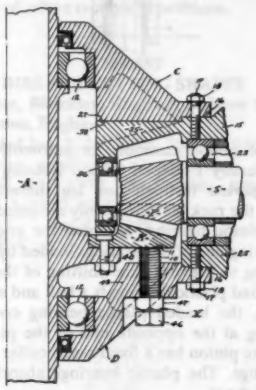


An installation for assisting the meshing engagement of a reverse speed gear wheel in a change-speed transmission intended in particular for motor vehicles, in which the reversing gear is constructed as sliding gear wheel and is adapted to be engaged with the gear wheels on the counter shaft and on the main shaft by means of a shifting element; the gear wheel on the counter-shaft is thereby wider in the direction toward the sliding gear wheel than the gear wheel on the main shaft while a brake constructed in the manner of blocking synchronizing device which cooperates with a fixed part of the transmission is coordinated to the sliding gear wheel.

3,745,848
SIDE THRUST LIMITER FOR RING AND PINION GEARING

Henry T. Halibrand, 1506 W. 228th St., Torrance, Calif.

Filed Dec. 30, 1971, Ser. No. 214,234
Int. Cl. F16h 57/00, 1/18
U.S. Cl. 74—410 21 Claims

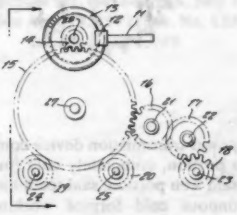


A limiting means that prevents excessive lateral deflection of a ring gear in opposition to the side thrust imposed by applying torque through interengagement with a pinion gear, and in the form of a closely adjustable thrust bearing engageable with the side of the ring gear as and when it is laterally deflected so as to restrict said deflection and thereby prevent undue damaging stresses otherwise imposed upon the bearings and supporting structure such as the gear case.

3,745,849
CROWN-PINION GEAR DRIVE FOR MODEL RAILROAD

Roger A. Matte, General Delivery, Zephyr, Ontario, Canada

Filed Mar. 29, 1971, Ser. No. 128,921
Int. Cl. F16h 1/12
U.S. Cl. 74—416 1 Claim



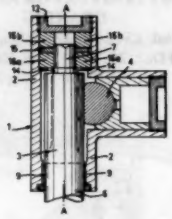
An improvement over the conventional worn gear drives for model railroads so to overcome the bucking and locking caused with worn gear drive, the device comprising a drive shaft with a pinion gear affixed thereto, the pinion gear engaging a crown gear integral and an axial alignment as one unit with a pinion gear engaging a main drive gear from which several drive gears take off power for transmitting to the wheels of a locomotive of a model railroad.

3,745,850

RACK AND PINION STEERING GEAR

Robert Vincent Bayle, Ecquevilly, France, assignor to Gemmer-France, Hauts-de-Seine, France

Filed Dec. 8, 1971, Ser. No. 205,961
Claims priority, application France, Dec. 11, 1970, 7044862
Int. Cl. F16h *1/04*; B62d *1/20*
U.S. Cl. 74—422 9 Claims



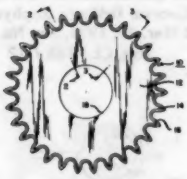
A rack and pinion assembly for automotive steering gear having a generally T-shaped tubular housing with a rack bar slidably supported through one leg thereof and a pinion meshed with the rack teeth rotatably mounted in the other leg thereof on plastic bearings adjacent the ends of the pinion teeth and having one of the bearings loaded by a plug threaded in the housing to prevent axial shifting of the pinion. In one form the loaded plastic bearing is a ball and socket joint. In a second form, the loaded plastic bearing cooperates with a thrust bearing at the opposite end of the pinion teeth. In a third form, the pinion has a fixed radial collar between loaded plastic bearings. The plastic bearings absorb vibration and dampen road shock.

3,745,851

POWER TOOTHED TRANSMISSION DEVICE

Maurice I. Zeldman; Glen W. Lindemann, and Murali Mahidhara, all of Pittsburgh, Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1971, Ser. No. 211,389
Int. Cl. F16h *55/04*; B21d *53/28*; B21k *1/30*
U.S. Cl. 74—434 7 Claims



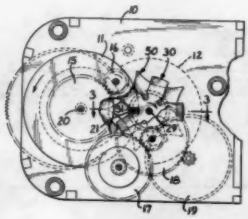
A toothed power transmission device comprising a centrally disposed web portion, completely cold formed teeth on the periphery of said web portion, said teeth having a laterally extending continuous cold formed working surface and a method of manufacturing a power toothed transmission device comprising the steps of selecting a substantially circular blank having a center hole, mounting said blank at its center hole on a rotatable mandrel, rotating said blank with rotating forming tools, contacting said forming tools with said blank to completely cold form finished teeth on said blank, whereby the blank material so contacted by said forming tools cold flows both axially and radially to form a laterally extending continuous cold formed working surface.

3,745,852

GENEVA TYPE MECHANISM FOR USE IN CLOCK TIMER OR THE LIKE

Ralph C. Robinson, Mooresville, N.C., assignor to General Time Corporation, Stamford, Conn.

Division of Ser. No. 863,886, Oct. 6, 1969, Pat. No. 3,597,918.
This application Dec. 22, 1970, Ser. No. 100,763
Int. Cl. F16h *55/04*
U.S. Cl. 74—436 4 Claims



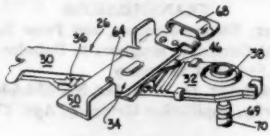
A geneva type mechanism in which a pin in a circular orbit engages radial notches in an indexed member to produce indexing advancement. A locking member, in the form of a polygon having escalloped sides and arranged flatly adjacent the indexed member, engages a locking disc associated with the pin. The indexed member has spokes between the notches extending radially for blocking engagement by the pin for bracing the indexed member against the effect of reversely applied torque to prevent jamming of the mechanism which tends to occur just prior to and following the indexing stroke.

3,745,853

ADJUSTABLE CONNECTING ARM

Raymond A. Deibel, West Falls, and William C. Reister, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Mar. 22, 1972, Ser. No. 236,850
Int. Cl. F16c *7/06*
U.S. Cl. 74—586 7 Claims

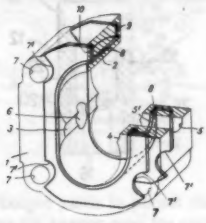


A connecting arm for transmitting motion from a windshield wiper motor to a windshield wiper arm is adjustable, lengthwise to permit accurate positioning of the windshield wiper arm in the parked position. The connecting arm includes a toothed surface meshing with an opposed toothed surface on an adjustable connecting arm end extension. The connecting arm end extension is secured to the end of the connecting arm with the opposing toothed surfaces in engagement. A releasable latching mechanism provides a compressive force between the connecting arm and connecting arm end extension to maintain the opposing toothed surfaces in meshing engagement when the arm extension is disposed in a suitable position. When the latching mechanism is released the connecting arm and the connecting arm end extension may be moved longitudinally relative to each other. The latching mechanism includes a bifurcated clip for securing a stud in a journal bearing at the end of the arm extension. A single latching operation retains the connecting arm in position in the linkage transmission and locks the adjustable end extension in proper position.

3,745,854
CAST REINFORCED HOUSING AND METHOD OF MAKING THE SAME

Robert Haag, Stuttgart-Bad Cannstatt; Albert Haupt, Oberriexingen, and Siegfried Mayer, Kleinglattbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 25, 1970, Ser. No. 66,741
Claims priority, application Germany, Sept. 27, 1969, P 19 49 033.6
Int. Cl. F16h *57/02*
U.S. Cl. 74—606 R 11 Claims

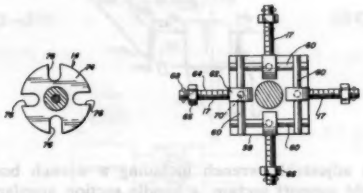


A cast reinforced housing comprises a cast peripheral housing wall defining an interior chamber for the components of an apparatus and preferably consisting of cast aluminum. At least one reinforcing embedment is provided in the wall and consists of a material having greater strength than the material of the wall, for example steel.

3,745,855
EMERGENCY MANUAL DRIVE FOR VALVE OPERATORS

Donald G. Fawkes, Aurora, Ill., assignor to Henry Pratt Company, Aurora, Ill.

Filed Aug. 23, 1971, Ser. No. 173,848
Int. Cl. F16h *35/00*
U.S. Cl. 74—625 4 Claims



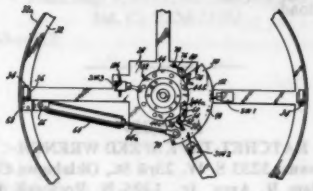
An emergency manual operator for motorized valve operators for use in the event of power or motor failure. The exemplary embodiment employs a rotatable hand wheel which freely receives a threaded shaft. The hand wheel is fixed relative to a valve operator casing and a selectively operable lock is provided between the hand wheel and a nut threadedly received on the shaft so as to lock the two against relative rotational or longitudinal movement when manual operation is required. When the lock is established, rotation of the hand wheel will reciprocate the threaded shaft to open or close a valve to which it may be attached.

3,745,856
CAROUSEL INDEXING SYSTEM FOR SOLID WASTE COMPACTOR

Maurice E. Aaron, Bound Brook, N.J., and Leonard Armstrong, Staten Island, N.Y., assignors to Resources Control Corporation, Middlesex, N.J.

Filed Feb. 29, 1972, Ser. No. 230,296
Int. Cl. B23b *29/32*
U.S. Cl. 74—819 4 Claims

An indexing mechanism particularly adapted to drive a turntable in a solid waste compactor system includes a central rotating hub mounting the turntable and carrying a series of drive pins. A drive plate is pivotally mounted adjacent the hub and includes a drive pawl for rotating the hub. The system may

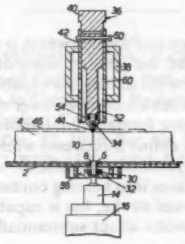


be adjusted to assume a selected number of indexing positions in each 360° rotation to accommodate turntables having different numbers of refuse receptical positions.

3,745,857
DIES FOR CUTTING SHAPES

Maurice Harman, Bletchley, England, assignor to W. Notting Limited, London, England

Filed Jan. 5, 1971, Ser. No. 104,055
Claims priority, application Great Britain, Jan. 8, 1970, 1,037/70; June 17, 1970, 29,396/70; June 18, 1970, 29,679/70; Oct. 1, 1970, 46,723/70
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 C 7 Claims

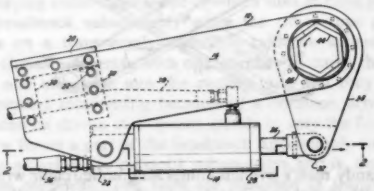


A method of making a cutting die, including the steps of selecting a sheet of plastics material having a strength of the same order as wood, making slots in the sheet by means of any kind which can progress laterally through the material in all directions, and mounting strips of metal in the slots.

3,745,858
TORQUING DEVICE

John L. Biach, 10 Indian Spring Road Cranford, N.J.

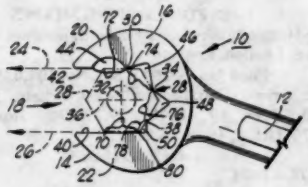
Continuation-in-part of Ser. No. 842,926, July 18, 1969. This application Apr. 19, 1971, Ser. No. 135,113
Int. Cl. B25b *13/46*
U.S. Cl. 81—57.39 9 Claims



An improved wrench is provided which includes an oscillating power unit adapted to provide a torque to a socket assembly during each forward stroke and a ratchet which permits the power source to return to its initial position of the

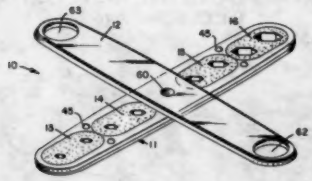
completion of each stroke without applying a reverse torque to the socket assembly. The wrench is designed to distribute the load of the power source evenly to the socket by causing each latch assembly of the ratchet to assume an equal share of the applied load.

3,745,859
RATCHET-TYPE SPEED WRENCH
James P. Evans, 3233 S. W. 23rd St., Oklahoma City, Okla., and William R. Avey, Jr., 1225 N. Rockwell, Oklahoma City, Okla.
Filed Sept. 16, 1971, Ser. No. 181,173
Int. Cl. B25b *13/46*
U.S. Cl. 81—119 **9 Claims**



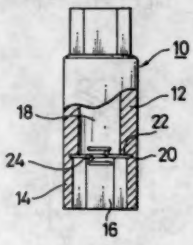
An improved open end wrench which is adapted for turning hexagonal head nuts, the wrench being of unitary formation with no moving parts yet having the capability of ratchet-type wrench return between successive power strokes. The wrench consists of a one piece formation of uniform substance having jaw portions which define a recessed wrench surface or configuration of non-symmetrical character which is capable of extending four surfaces into bearing contact with a hexagonal head nut during power stroke, but is capable of unobstructed reverse or return stroke about substantially the same axis of revolution.

3,745,860
HANDY MAN'S WRENCH
Robert A. Bennett, 38 Falmouth Drive, Shelton, Conn.
Filed Sept. 13, 1971, Ser. No. 179,828
Int. Cl. B25b *13/06*
U.S. Cl. 81—121 R **10 Claims**



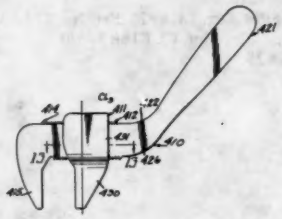
A handy man's wrench comprising noncircular wrench inserts with socket openings stored in the wrench handle under a pivoting cover and interchangeable to matingly shaped end positions thereon. The desired size socket opening in a wrench insert is placed in the end position of the wrench handle for engaging and turning a standard hexagonal nut with levered force applied to and transmitted through the handle.

3,745,861
PLUG HOLDING SOCKET
Katsuyuki Totsu, No. 04-7, 3-chome, Oshiage, Sumida-ku, Tokyo, and Noboru Morifuji, No. 5-182, Tsukamoto-cho, Higash, Yodogawa-ku, Osaka, both of Japan
Filed July 30, 1971, Ser. No. 167,660
Claims priority, application Japan, July 31, 1970, 45/76832
Int. Cl. B25b *13/02*
U.S. Cl. 81—125 **2 Claims**



A plug holding socket comprising a hollow body and a housing means which includes a spring member for elastically holding an insulation part of plug.

3,745,862
ADJUSTABLE WRENCH
Thomas H. Sharp, 502 Dorr Avenue, Belvedere, S.C.
Filed June 25, 1971, Ser. No. 156,788
Int. Cl. B25b *13/18, 13/24*
U.S. Cl. 81—147 **3 Claims**

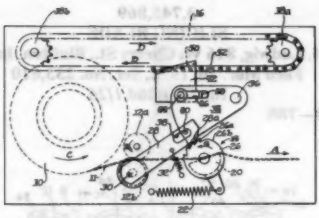


An adjustable wrench including a wrench body with a straight support section, a handle section angularly located with respect to the straight section and joined to one end thereof, and a stationary jaw integral with the other end of the support section. A movable jaw unit having a complementary jaw and a carrier is provided for cooperating with the stationary jaw. The carrier defines a passage therethrough for receipt of the wrench body and is dimensioned and arranged to pass over the juncture of the supporting and handle sections. An adjusting mechanism is provided for selectively positioning the movable jaw unit with respect to the stationary jaw.

3,745,863
SEVERING MECHANISM
Robert W. Murre, Chicago, and Herman C. Schulz, Skokie, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Jan. 6, 1972, Ser. No. 215,819
Int. Cl. B26d *5/08, 5/22*
U.S. Cl. 83—224 **15 Claims**

A severing mechanism for cutting sheets or strips of paper or other sheet material from a length thereof, including a rotatably mounted knife spring biased in one direction of rotation for cutting purposes. An arcuate ratchet is mounted at one end of the knife. A cocking pawl is oscillatably mounted for incrementally rotating the knife to a cocked condition by

engaging the ratchet teeth seriatim, and a keeper pawl is engageable with the ratchet teeth to prevent rotation of the knife on the back strokes of the oscillating cocking pawl. A cam type trip member engages the pawls to lift the pawls off of the ratchet, thereby releasing the knife for cutting. In one form of the invention, a lost motion connection is provided between



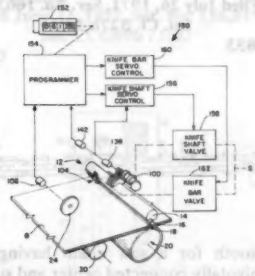
the cocking and keeper pawls to permit the cocking pawl to oscillate relative to the keeper pawl for cocking the knife but to cause both of the pawls to be moved off of the ratchet when one of the pawls is tripped. In another form, the cocking pawl is moved off of the ratchet prior to the keeper pawl so that the oscillatory movement of the cocking pawl does not interfere with sharp release of the knife.

3,745,864

OSCILLATING KNIFE-ROTATING ANVIL FLYING CUTTER

Raymond Slaysman Watson, Baltimore, Md., assignor to The Ward Machinery Company, Cockeysville, Md.

Filed Nov. 3, 1971, Ser. No. 195,216
Int. Cl. B26d *5/38*
U.S. Cl. 83—295 **10 Claims**



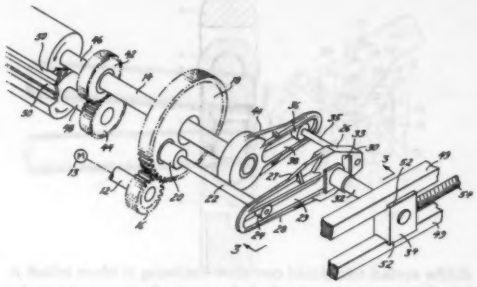
A flying cut-off knife for severing a continuously moving web of corrugated paperboard or the like to any length or lengths required; a length-setting switch directs a servo-system which effects close tolerance running changes in lengths cut taking into account board velocity and distance advanced; the servo-system controls a low inertia oscillating shaft having a pivotally retracting blade which rides against a mechanical rotation stop during cutting; prior to cutting the servo-system matches blade velocity to concurrently measured board velocity; cutting is simultaneous across the board; at the deepest point the blade penetrates through into the surface of a synchronously rotating anvil drum supporting the far side of the board; the principal parts of the invention are related by three parallel axes substantial superimposed.

3,745,865

CYCLIC VARIABLE SPEED DRIVE

Ray Clifford Johnson, Holden, Mass., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Aug. 9, 1971, Ser. No. 170,183
Int. Cl. B23d *25/02*
U.S. Cl. 83—313 **10 Claims**



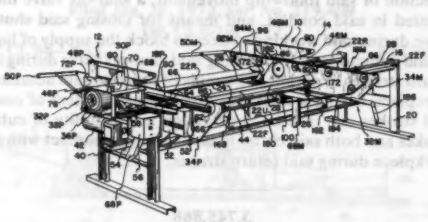
A variable speed drive employing two crank and slider mechanisms so that the speed change created by each of the slider crank mechanisms is multiplied by the speed change created by the other slider crank mechanism. The drive permits variable output speeds from a constant input speed.

3,745,866

SELF-FEEDING DOUBLE-CUT SAW

Thomas A. Junk, and Carl P. Junk, both of Colorado Springs, Colo., assignors to Component Equipment Manufacturing, Inc., Colorado Springs, Colo.

Filed Dec. 22, 1970, Ser. No. 100,668
Int. Cl. B27b *25/04, 7/04;* **B26d** *7/06*
U.S. Cl. 83—423 **5 Claims**



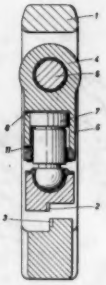
This invention relates to a saw for cutting a plurality of work pieces to the same length that is characterized by a pair of dog-carrying roller chains, one of which runs in fixed position on a headstock subassembly while the other runs parallel thereto on a transversely-adjustable tailstock subassembly. These chains cooperate with one another to carry the work pieces one at a time into the cutting area and they run in synchronized relationship because of a common drive shaft which can be driven at different speeds to vary the feed rate. One saw forms a part of the headstock subassembly while the other is a part of the tailstock subassembly and is, therefore, movable therewith. The saws are mounted in transversely-spaced parallel relation to one another about a common horizontal axis of rotation while one feed chain is longitudinally adjustable relative to the other so that the work pieces will move into the blades simultaneously in perpendicular relation to the planes defined thereby.

3,745,867

SHEARING MACHINE

Gustav Scherb, Linz, and Norbert Auer, Traun, both of Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed July 23, 1971, Ser. No. 165,454
Claims priority, application Austria, Aug. 4, 1970, A 7056/70
Int. Cl. B26d *5/08*
U.S. Cl. 83—554 **6 Claims**



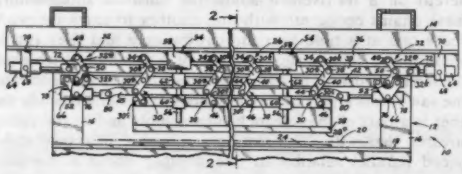
A drive cutter blade and a backing cutter blade are mounted in a frame and relatively movable toward and away from each other to cut through a workpiece disposed between them. An eccentric drive mechanism is connected to said driven cutter blade and operable to perform alternating cutting strokes in the direction from said driven cutter blade toward said backing cutter blade and return strokes in the direction from said backing cutter blade toward said driven cutter blade. Said cutter blades are adapted to be spaced apart a distance which exceeds the extent of one of said strokes. One of said cutter blades is a follow-up cutter blade. Follow-up drive means are connected to said follow-up cutter blade and adapted to impart to said follow-up cutter blade a follow-up movement toward the other cutter blade during each of said return strokes. Said follow-up drive means comprise a hydraulic actuator connected to said follow-up cutter blade, a hydraulic supply conduit connected to said actuator and adapted to supply liquid under pressure thereto in the direction of said follow-up movement, a shut-off valve incorporated in said conduit, and means for closing said shut-off valve during said working strokes to block the supply of liquid to said actuator and for opening said shut-off valve during said return strokes to permit of a supply of liquid to said actuator A workpiece having a thickness exceeding the extent of one of said strokes can thus be cut through in a plurality of cutting strokes and both said cutter blades remain in contact with said workpiece during said return strokes.

3,745,868

CLIPPER WITH DOUBLE-ACTION TOGGLE MECHANISM

Thomas H. Prentice, 9015 S. W. 19th Avenue, Portland, Oreg.

Filed Sept. 30, 1971, Ser. No. 185,089
Int. Cl. B26d *5/18*
U.S. Cl. 83—630 **9 Claims**



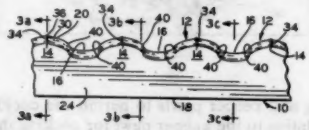
A veneer clipper in which the movable knife is driven through a double-action toggle mechanism that is powered by a pair of reciprocable pneumatic motors. The toggle mechanism include two sets of corresponding pivoted joints, with each motor drivingly connected to a different one of such sets. One of the motors is mounted in a nontraveling position on the clipper's frame, while the other motor is mounted for travel relative to the frame, generally in the same direction as the knife.

3,745,869

SLICING BLADE

Clarence H. Ludwig, 816 W. Cherry St., Bluffton, Ind.

Filed Mar. 10, 1972, Ser. No. 233,610
Int. Cl. B26d *1/26*
U.S. Cl. 83—788 **6 Claims**



A flexible slicing band has a relatively thin cross section to provide a flexible endlessly movable band which includes a cutting edge scalloped to provide a plurality of regularly spaced peaks and valleys. The peaks terminate in cutting points and the profile of the cutting edge is tapered from each side of the blade toward the cutting edge. The cutting edge is scalloped to include a cutting corner by reverse curvature of the cutting edge intermediate each valley and crest of the scallops in order to prolong the life of the blade. A superimposed grinding may be made on the cutting edge to form a compound taper reducing the cross section of the blade in the vicinity of the cutting edge to provide additional relief at the cutting edge as the blade passes through the article intended to be cut.

3,745,870

SAW CHAIN

Douglas J. Lemery, 3215 Ripon Road, Victoria, British Columbia, Canada

Filed July 26, 1971, Ser. No. 166,033
Int. Cl. B27b *33/14*
U.S. Cl. 83—833 **17 Claims**

A cutter tooth for a saw chain having a reappearing sequence of pivotally connected center and side links wherein the cutter tooth is made up of two separate and flexible center mounted cutter tooth elements which extend laterally and upwardly from the center line of the chain to form the cutter tooth. The cutter tooth elements are made of flexible steel and are of proper thickness to allow the cutter elements to flex outwardly under cutting loads to obtain a kerf which is slightly wider than the mechanical width of the cutter elements when not under load. The two piece cutter tooth has its own depth gauge integral therewith for positive control. A pair of novel L-shaped raker teeth is used in combination with the two piece cutter. Each raker tooth is flat in a transverse direction, has a reverse angle on its leading edge as compared to conventional rakers. The raker teeth are oppositely directed and so constructed as to remove chips across the complete width of the kerf to clear the way for succeeding depth gauge elements. Each raker tooth also has its own integral depth gauge.

3,745,871

AUTO PIPE MUSICAL INSTRUMENT

Louis Diez, Brooklyn, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 10, 1972, Ser. No. 270,047
Int. Cl. G10d *11/00*
U.S. Cl. 84—375 5 Claims

A musical instrument which is played by being held in the mouth, without the requirement of being hand-held. The pitch of the instrument is determined by the free length of a reed, which is varied by spring mounted piston. Pushing the piston, by the tongue, acts to rotate the rollers about which the reed is fastened, so as to shorten the free length of the reed and to so raise the note produced by the reed when it vibrates in the air stream produced by the player.

3,745,872

DEVICE FOR USE IN TRANSPOSING MUSICAL KEYS OR NOTES

Michael Arthur Charles Hill, 55 Mountview Court, Green Lane, London, N.8, England

Filed June 23, 1971, Ser. No. 156,019
Int. Cl. G09b *15/02*
U.S. Cl. 84—473 8 Claims

A device for use in transposing musical keys or notes comprises two scale-carrying members which when aligned, show not only the relation of the new key signature to the old key signature, but also the equivalents between all the notes of the new and the old key signatures.

ERRATUM

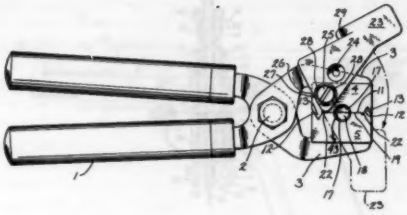
For Class 84—423 see:
Patent No. 3,745,874

3,745,873

BULLET MOLD

Richard J. Lee, R. R. 2, Hartford, Wis.

Filed Aug. 3, 1971, Ser. No. 168,569
Int. Cl. C06b *21/02*; F42b *33/10*
U.S. Cl. 86—1 8 Claims



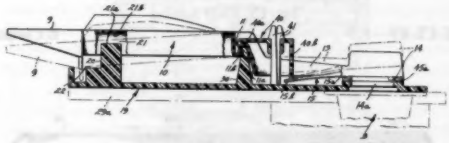
A bullet mold is provided with two block-like halves which are formed as part of an extruded aluminum bar, cut off, and then reversed to form a complimentary matching pair. Mating V-grooves and raised ribs disposed along the longitudinal edges of the inner mold block faces provide ease of transverse location. Pin and groove means provide longitudinal location. Longitudinal air vents are disposed proximate the mating V-grooves and ribs, and the planular mating faces are knurled to provide fine vent grooves leading from the mold cavity to the longitudinal vents. The sprue plate is held in position by a wave washer to eliminate undesirable torque. The mold cavity is formed by rotating the clamped halves in a screw machine spindle and using appropriate tools.

3,745,874

MUSICAL KEYBOARD

Harold B. Martin, West Caldwell, and Herman O. Rogg, Watchung, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.

Filed Jan. 20, 1972, Ser. No. 219,409
Int. Cl. G10c *3/12*
U.S. Cl. 84—433 12 Claims



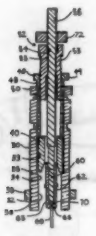
A musical keyboard which includes at least one single molded baseplate and a fulcrum extending upwardly from the baseplate near the mid-portion thereof. A predetermined number of single molded keys are cooperatively associated with the base plate, each key including a body having a substantially inverted V-shaped groove located on the bottom surface of the body near its mid-section for pivotal contact with the fulcrum, and a tongue extending from the terminal portion of the body, said tongue having a free end located in proximity to the inverted V-shaped groove. Means are provided for holding the key in a desired predetermined rest position wherein a pre-loaded stress is placed upon the tongue for providing the necessary tension to hold the key in a static position and for causing the key to be returned to said static position upon a release thereof from a finger-depressed position.

3,745,875

CARTRIDGE RELOADING DIES

Neil James Kennedy, 437 5th Avenue, Kimberley B.C., Canada

Filed Jan. 12, 1971, Ser. No. 105,911
Int. Cl. F42b 33/02
U.S. Cl. 86—23 5 Claims



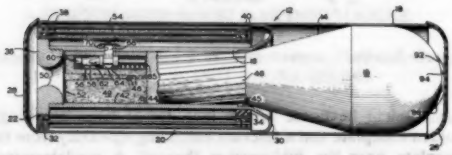
A tool for reloading a variety of sizes of spent cartridge cases comprising a normally upright, externally threaded, hollow, cylindrical body mounted in a reloading press. The upper portion of the body is internally threaded and of greater diameter for receiving a selected cartridge case receiving die, a first externally threaded sleeve is received in the body. A threaded bore in the sleeve receives a second externally threaded sleeve which has a threaded bore for receiving a threaded rod having a resizing and decapping tool at a lower end thereof. Alternatively, a bullet seating tool having a substantially conical recess in its lower end for engaging the nose of a bullet is threadedly received in the first sleeve in place of the resizing tool.

3,745,876

TELESCOPING AMMUNITION LAUNCHER

John G. Rocha, Westfield, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1961, Ser. No. 82,656
Int. Cl. F41f 3/02
U.S. Cl. 89—1.7 8 Claims



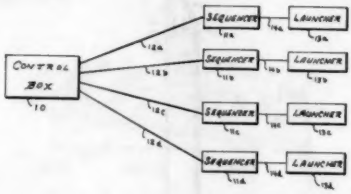
1. A telescopic firearm including a firing tube for the discharge of a projectile, a blast deflector, a flash deflector for receiving said firing tube and blast deflector when telescoped thereinto, covers mounted by hinges on said flash deflector for closing the ends thereof, and a sight system incorporated in said covers.

3,745,877

INTERVALOMETER FOR PARACHUTE FLARE LAUNCHER

James J. Dobson; Thomas L. Dellecave; Rudolf R. Konegen, and John R. Miller, all of Rome, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 22, 1971, Ser. No. 210,871
Int. Cl. F41f 3/04, 13/08
U.S. Cl. 89—28 4 Claims



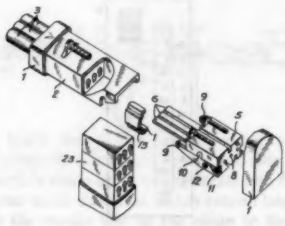
A control apparatus for automatically launching parachute flares from launchers which may be positioned in various different locations. The control apparatus which is located at a distance from the launchers contains the firing, timing and safety circuits necessary to launch the parachute flares in sequence.

3,745,878

INFANTRY WEAPON ADAPTED TO FIRE A PLURALITY OF CARTRIDGES SIMULTANEOUSLY

Pierre Jampy, 5 rue Pauphile; Henri Bouix, Cote du Monteil, and Rene Armand, 22, rue Georges Thyvent, all of 19 Tulle, France

Continuation-in-part of Ser. No. 67,096, Aug. 26, 1970, Pat. No. 3,720,133. This application Jan. 7, 1972, Ser. No. 216,117
Int. Cl. F41c 9/22, 25/00
U.S. Cl. 89—33 B 6 Claims



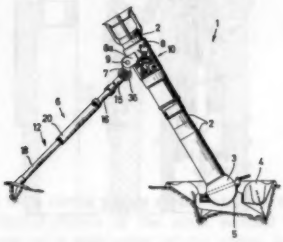
An infantry weapon comprises a carrier block with a plurality of firing chambers and barrels carried by the block in extension of the chambers. A clip with a plurality of cartridges equal to the number of barrels is fed from a stack in the weapon and a breech block carrier pushes the cartridges from the clip into the firing chambers. After percussion of the cartridges, the breech block carrier and carrier block retract to enable insertion of a new clip into the weapon and expulsion of the old clip after the spent cartridges have been reintroduced therein.

3,745,879

GRENADE LAUNCHER BIPOD SUPPORT

Niilo Kakrvo Asikainen, Kaupinkatu, and Esko Ilmari Koskinen, Salhojankatu, both of Finland, assignors to Oy Tampella AB, Tampere, Sweden

Filed Jan. 12, 1971, Ser. No. 105,862
Claims priority, application Germany, Jan. 24, 1970, P 20 03 182.7
Int. Cl. F41f *21/00*
U.S. Cl. 89—37 C 7 Claims



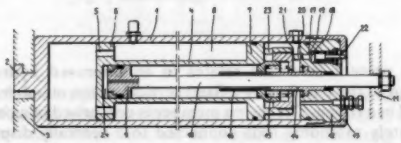
A grenade launcher bipod support in which the two legs of the bipod are individually adjustable. The adjustment for each leg includes an internally threaded adjusting sleeve into which upper and lower portions of the legs are threaded so the legs are adjusted in turnbuckle fashion. The upper ends of the legs are pivotally mounted on a connector by gear segments which are in mesh so the legs can only be pivoted simultaneously. A connecting bracket is pivotally connected to the connector and the bracket is in turn pivotally connected to the barrel of the grenade launcher. Means are provided to lock both pivotal connections of the connecting bracket as well as to lock the gear segments so the bipod assembly remains in the position to which it is manually set.

3,745,880

HYDROPNEUMATIC RECUPERATOR FOR PIECES OF ORDNANCE

Josef Metz, Neuss, and Erich Zielinski, Gruiten, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Aug. 24, 1971, Ser. No. 174,370
Claims priority, application Germany, Oct. 29, 1970, P 20 53 098.7
Int. Cl. F41f *19/02*
U.S. Cl. 89—43 R 3 Claims



A hydropneumatic recuperator for pieces of ordnance, having pressure spaces for a pressure gas and a pressure liquid separated by a piston which comprises a recuperator cylinder containing pressure liquid and guided during the recoil of a gun barrel. A recuperator piston is provided within the recuperator cylinder. The recuperator piston has a piston rod which is adapted to be connected with the gun barrel. A storage cylinder is adapted for attachment to a gun cradle and defines the pressure space for pressure gas. An annular piston is provided on the periphery of the recuperator cylinder effecting the separation of the pressure gas and the pressure liquid.

3,745,881

COMBINATION SLIDE LATCH AND TAKEDOWN MECHANISM FOR AUTOMATIC PISTOL

Robert E. Roy, East Haven, Conn., assignor to Colt's Inc., Hartford, Conn.

Filed Sept. 24, 1971, Ser. No. 183,328
Int. Cl. F41d *5/02*
U.S. Cl. 89—163 9 Claims

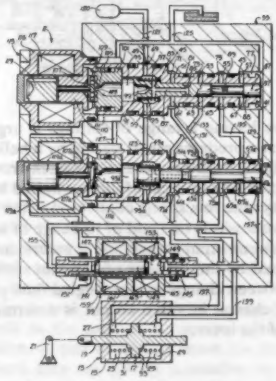
A takedown lever operable from a slide stop position to a slide release position wherein the takedown lever automatically activates a slide stop-open latch to prevent inadvertent forward slide release during disassembly.

3,745,882

DIGITAL CONTROL VALVE AND CONTROL SYSTEM

Robert L. Anderson, Tustin, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Dec. 27, 1971, Ser. No. 212,187
Int. Cl. F01b *31/12*; F15b *21/02*
U.S. Cl. 91—1 15 Claims



A control system comprising an actuator, a digital control valve for controlling the position of the fluid responsive member of the actuator, a device for producing a command signal for commanding a particular position of the fluid responsive member and electronic apparatus for processing the command signal to provide an input signal to which the digital control valve is responsive. The digital control valve includes two valves for moving the fluid responsive member of the actuator in opposite directions, respectively, and a digitizer for controlling the displacement of the fluid responsive member. In one form of the invention the control system includes a plurality of digital control valves with each of the

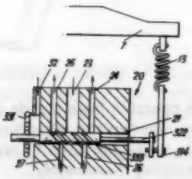
digital control valves moving the fluid responsive member different amounts in response to appropriate input signals. By energizing more than one of the digital control valves, a step equal to the sum or difference of the energized digital control valves can be obtained.

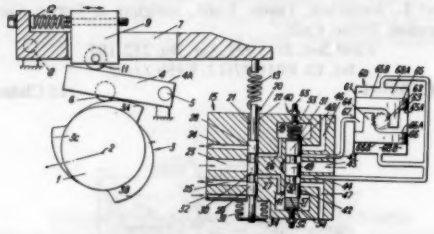
3,745,883

SERVO-SYSTEMS

Edward J. Ward, Haywards Heath, and Rodney Way, Portslade, both of England, assignors to The Worcester Valve Company Limited, Sussex, England

Division of Ser. No. 66,678, Aug. 25, 1970, Pat. No. 3,693,501.
This application July 3, 1972, Ser. No. 268,267
Claims priority, application Great Britain, Aug. 28, 1969, 42,853/69; June 26, 1970, 31,179/70
Int. Cl. F15b *13/16*; F01b *7/04*
U.S. Cl. 91—186 **19 Claims**





A servo-valve having a range of settings is urged progressively to or from a predetermined setting by a bellows responsive to input-signal fluid pressure. Feed-back from the valve output is to a cam having a cam follower linked by a lever of variable velocity ratio to a spring connected to the valve which biasses the valve towards one end of its range of settings. The relationship between input-signal fluid pressure and valve output is determined by the contour of the cam surface and the relationship between change in input-signal fluid pressure and corresponding change in valve output is determined by the velocity ratio of the lever.

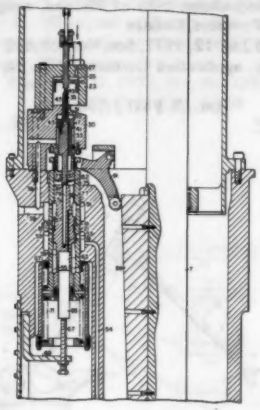
3,745,884

CONTROL APPARATUS FOR OPERATING A CONTROL VALVE SERVO-MOTOR

Ola J. Aanstad, Chester, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1971, Ser. No. 158,335
Int. Cl. F15b *9/10, 15/17*
U.S. Cl. 91—374 **10 Claims**

A hydraulic control apparatus for controlling the flow of pressurized working fluid to a hydraulic servo-motor which operates a hydraulic control valve, wherein the control apparatus utilizes two stages of pressure control to position a spool valve, which regulates the flow of working fluid to and from the servo-motor to operate the control valve and a feed-



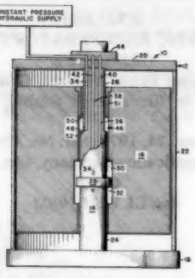
back sleeve, which is cooperatively associated with the spool valve and servo-motor to position the servo-motor at each level of control pressure.

3,745,885

HYDRAULIC VIBRATOR

Delbert W. Fair, and J. H. Miller, Jr., both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 7, 1971, Ser. No. 187,476
Int. Cl. F01b *15/00*
U.S. Cl. 91—216 B **4 Claims**



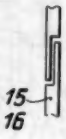
The present invention relates to an improved hydraulic vibrator of the type having a fixed vertical piston member supported in a frame. The piston member is comprised of a pair of oppositely extending rods connected to a centrally disposed drive piston and a reaction mass is reciprocally disposed around the drive piston forming a hydraulic cylinder so that when hydraulic fluid is introduced to the cylinder relative to the drive piston the reaction mass is reciprocated. By the present invention, one of the rods connected to the drive piston is provided with an upwardly facing annular shoulder thereby forming a single acting piston, and a downwardly facing annular shoulder is provided in the reaction mass positioned to form a hydraulic biasing cylinder around the single acting piston whereby hydraulic fluid may be introduced to said biasing cylinder to bias the weight of said reaction mass. Port means for introducing hydraulic fluid to said biasing cylinder are provided connected to said biasing cylinder and to a source of constant pressure hydraulic fluid.

3,745,886

THRUST PISTON MOTOR OPERATING WITH A GASEOUS FLUID MEDIUM

Harry Scheffer, Brackwede, Germany, assignor to Kruger, Harry, GmbH, Brackwede, Germany

Filed Mar. 31, 1971, Ser. No. 129,861
Claims priority, application Germany, Apr. 1, 1970, P 20 15 472.7
Int. Cl. F01l *25/06*
U.S. Cl. 91—306 5 Claims



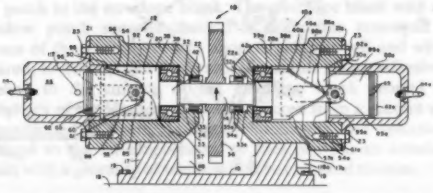
A main valve for a thrust piston motor wherein two angled bores of the control piston of the main control valve terminatein the zone of a restriction of the piston in first and second radial outlet ports, the axial distance between which is substantially equal to the length of the restriction, and in that the slide carries in a zone of the restriction a displaceable control sleeve mounted thereon acting as a movable supplementary valve element, and so dimensioned that in one end position it closes the outlet of the first channel and opens the outlet of the second channel, and in the other end position it opens the outlet of the second channel and closes that of the first channel.

3,745,887

ENGINE POWER UNIT

George Striegl, Prescott, Ontario, Canada, assignor to Temco Contact Ltd., Ottawa, Ontario, Canada

Filed June 18, 1971, Ser. No. 154,446
Claims priority, application Canada, Mar. 31, 1971, 109261
Int. Cl. F01b *1/00*; F16h *25/16*; F02b *75/26*
U.S. Cl. 92—146 29 Claims



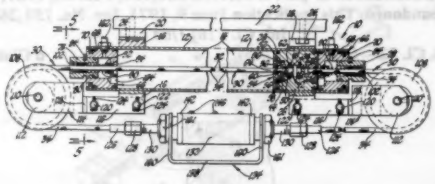
Disclosed is a power unit and engine wherein reciprocal motion of piston means are transformed into rotary motion of an output shaft without the aid of cranks and connecting rods. More particularly is disclosed a power unit which includes at least one cylinder piston assembly and an axially aligned rotor cam means connected to a drive shaft which means, in operative association with the piston which is guided for reciprocation only, transforms the reciprocal motion of the piston into rotary motion of the drive shaft. In the preferred form there is employed two substantially identical but opposed cylinder, piston and rotor assemblies in axial alignment, with means associated with the opposed pistons for causing them to reciprocate in unison. The opposed rotor means are connected to a unit shaft and are hollow, cylindrical rotors having annular cam surface means which in operative association with piston cam rollers transforms the reciprocal motion of the pistons into rotary motion of the unit shaft. The means for causing said pistons to reciprocate in unison comprises rod means between the pistons and slidably received within a bore through the unit shaft. The length of the rod means is such to control the separations of said pistons whereby a power stroke of one piston effects the return stroke of the opposed piston and maintains the cam rollers of the opposed piston in disengagement from the cam surface means of its associated rotor means during its return stroke. In addition is disclosed a steam engine with the operative association of a plurality of these power units about a common, central output drive shaft. Timed valve means control the flow of steam through the cylinders of the units and a mechanism is provided for advancing the valve means in response to an increase in rotation of the central drive shaft. Further a lubrication system is disclosed for such engine. When a power unit is adapted in an internal combustion engine, there is provided a power storage piston which stores energy from the initial impingement caused by firing the working fluid and which subsequently releases substantially all the stored energy during the power stroke of the piston whereby the sudden build-up of stress in the cam engaging surfaces is reduced.

3,745,888

FLUID OPERATED LINEAR MOTOR

Napoleon P. Boretti, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1971, Ser. No. 201,816
Int. Cl. F15b *15/22*; F01b *9/00*; F16j *1/00*
U.S. Cl. 92—9 7 Claims



A fluid operated linear motor includes an elongated container member defining an elongated cylindrical cavity that receives a piston mounted for reciprocal movement in sealing engagement with the container member. A pair of cables have respective first ends secured to opposite ends of the piston and extend through apertures adjacent the ends of the cavity. Washer seals are received within the apertures in engagement with the cables to seal the ends of the cavity. End plugs are selectively held in the ends of the apertures to maintain the seals in position. A pair of springs move the seals out of the apertures where they are readily accessible for replacement upon removal of the end plugs. The cables extend outwardly from the apertures over a pair of pulleys respectively mounted on a pair of arms that are selectively pivotable to positions locating the pulleys away from the apertures to further facilitate seal accessibility during replacement. The other ends of the cables are respectively secured to rods of a pair of pistons received within an oil filled cylindrical member of a slack take-up mechanism while in an alternate embodiment the cylindrical member defines a pair of cavities respectively receiving the pistons. A pair of springs extending between the pistons and the cylindrical member bias the pistons toward each other to absorb slack in the cables, while check valve assemblies allow oil flow through the pistons during slack absorbing movement but prevent oil flow in the opposite direction and movement of the pistons away from each other.

3,745,889

PISTONS FOR INTERNAL COMBUSTION ENGINES, OR FOR COMPRESSORS

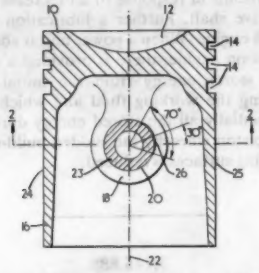
Harold Taylor Hill, Sway, Hampshire, and David Francis Fletcher-Jones, New Milton, Hants, both of England, assignors to Wellworthy Limited, Hampshire, England

Filed Jan. 19, 1972, Ser. No. 219,057

Claims priority, application Great Britain, Feb. 9, 1971, 4,236/71

Int. Cl. F16j 1/16

U.S. Cl. 92—187 **4 Claims**



A piston for an internal combustion engine or a compressor has a gudgeon pin bore of which a segment of the gudgeon pin bore wall is relieved on one side only of a plane which contains the axis of the gudgeon pin and is parallel to the piston axis.

3,745,890

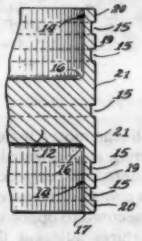
RINGLESS PISTON

Nino F. Costarella, 5311 S. Howell Avenue, Milwaukee, Wis.

Continuation-in-part of Ser. No. 800,956, Feb. 20, 1969, abandoned. This application June 9, 1971, Ser. No. 151,268

Int. Cl. F16j 1/04

U.S. Cl. 92—192 **6 Claims**



A ringless piston in which a sealing flange at one or both ends of the piston has a thickness such that it expands under working pressure and in accordance with bursting tendencies of the flange. The piston and flange in the absence of pressure within the cylinder have a normal running clearance with the cylinder wall.

3,745,891

BLANK WRAPPING MECHANISM AND METHOD FOR FRUSTO-CONICAL CUP-MAKING MACHINES

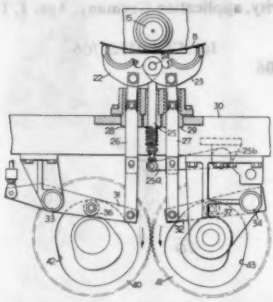
Raymond E. Bodendoerfer, Brookfield, Wis., assignor to Paper Machinery Corporation, Milwaukee, Wis.

Filed Aug. 5, 1971, Ser. No. 169,452

Int. Cl. B31b 1/28

U.S. Cl. 93—36.1 **1 Claim**

A machine for making two-piece paper cups including individually actuated folding wings for wrapping the blank around a frusto-conical mandrel. The wings are actuated by cams which swing the folding wings rapidly through the initial wrapping phase without applying any appreciable clamping pressure, and then apply a final squeezing action to the blank against the mandrel just prior to the sealing of its longitudinal seam. A method of wrapping a blank around a mandrel with a fast initial wrapping action followed by a final squeezing of the blank tightly against the mandrel.



3,745,892

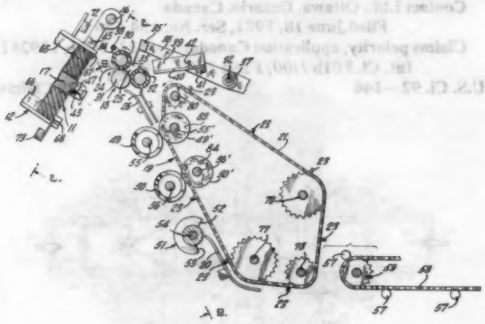
METHOD AND APPARATUS FOR AUTOMATICALLY CORNER-BREAKING THE SIDE FLANGE EDGES OF PAPERBOARD BLANKS

Robert H. Ganz, 8 Ridge Crest Road, Saddle River, N.J.

Filed July 28, 1971, Ser. No. 166,757

Int. Cl. B31b 1/52, 1/56

U.S. Cl. 93—49 M **18 Claims**



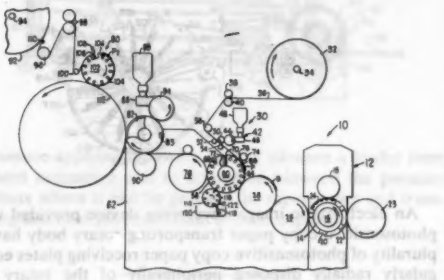
The invention contemplates apparatus and a method for automatically cornerobreaking the side-flange edge folds of a paperboard blank having a central-panel area contiguous to and integral with longitudinally opposed side-flange areas. First pinch-roll means accepts flat stock, pinches the same to corner-break at a first desired alignment, and passes the entire blank to arresting and positioning means on the other side of the first pinch-roll means. When thus arrested, the blank is positioned adjacent second pinch-roll means, which is caused to accept and pinch the blank to corner-break at a second desired alignment. The blank passes through the first and second pinch-roll means in a continuous path of motion, interrupted only for displacement reversal when positioned for passage through the second pinch-roll means. In the specific form shown, the first and second pinch-roll means collectively comprises three rollers, wherein the central roller coacts with one of the other rollers to define the first pinch-roll means, and wherein the central roller coacts with the remaining roller to define the second pinch-roll means.

3,745,893

APPARATUS FOR APPLYING PATCHES TO ENVELOPE BLANKS

Herbert W. Helm, Hollidaysburg, Pa., and John Gail O'Keefe, Dallas, Tex., assignors to F. L. Smith Machine Company, Inc., Duncansville, Pa.

Filed Aug. 26, 1971, Ser. No. 175,142
Int. Cl. B31b *1/24, 1/82*
U.S. Cl. 93—61 A 6 Claims



A continuous strip or web of patch material is unwound from a reel by means of a pair of pull rolls. The patch material is conveyed to adhesive applying apparatus where adhesive is applied to preselected portions of one surface of the web. The web of patch material having the adhesive applied to selective portions of one surface is engaged by a vacuum roll by suction. The vacuum roll has patch severing apparatus that cuts preselected lengths of the web to form window patches having adhesive applied to selected portions of one surface. Envelope blanks are conveyed through a panel cutter mechanism where one or more windows are formed in the envelope blank at desired locations. The envelope blanks are conveyed with the inner surface facing outwardly by means of a plurality of transfer rolls. One of the transfer rolls is in abutting relation with the vacuum roll and the envelope blank is transferred to the vacuum roll from the transfer roll and is engaged to the transfer roll with one of the windows in the envelope blank in overlying relation with a patch on the vacuum roll. The vacuum roll and adjacent transfer roll exert a compressive force on the envelope blank and patch to adhesively secure the patch to the envelope blank. The envelope blank with one window patch secured thereto is thereafter conveyed by means of the vacuum roll to another transfer roll and where desired, to other patch applicator apparatus where adhesive is applied to the surface of the envelope blank around the periphery of the window. A patch severed from a second web is positioned in overlying relation therewith and adhesively secured to the envelope blank to thus provide an envelope blank with a plurality of window patches secured thereto.

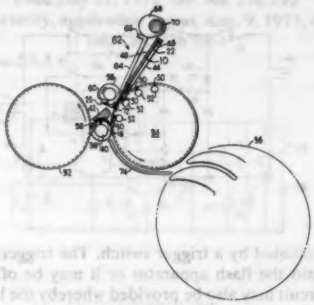
3,745,894

FLAP FOLDING APPARATUS

Herbert W. Helm, Hollidaysburg, Pa., assignor to Smithe, F. L., Machine Company, Inc., Duncansville, Pa.

Filed Aug. 24, 1971, Ser. No. 174,404
Int. Cl. B31b *1/34*
U.S. Cl. 93—61 9 Claims

A machine for making envelopes and the like includes apparatus for folding both a top closure flap and a second latex fold flap in the bottom flap portion of the envelope blank. A feed roll feeds the envelope blank with the closure flap trailing onto a closure flap cylinder. The body of the envelope blank is conveyed along the surface of a folding cylinder onto support slats until the envelope blank front edge engages a stop member. The closure flap is engaged by vacuum on the closure flap cylinder and the latex fold flap is engaged by a second flap cylinder. A cam actuated tucker engages the bottom flap adjacent the score line for the latex fold flap and urges the envelope blank downwardly on the support slats. The rotating folding cylinder engages the body portion of the envelope blank and conveys the envelope blank toward a delivery device. Both the closure flap and the latex fold flap are engaged by the respective closure flap cylinders and are



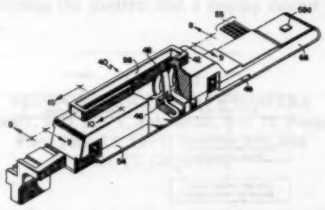
folded along the score lines by rotation of the respective flap cylinders in a direction opposite to the folding cylinder. Both of the flaps are creased along the fold line by the closure flap cylinder. The envelope blank is then transferred from the folding cylinder to a suitable spiral delivery.

3,745,895

FLASH SOCKET ASSEMBLY

Edison R. Brandt, Cohasset, and James K. Skurski, Beverly, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 6, 1971, Ser. No. 204,830
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R 8 Claims



A flash socket assembly for use in or with a photographic camera is constructed to receive a multilamp flash assembly having at least one array of lamps facing in a common direction and a thin, shallow connector blade adapted to be inserted into the socket assembly. An electronic flash selecting circuit, preferably fabricated as an integrated circuit chip, selects one or more of the lamps for ignition in accordance with a predetermined selection program when a firing command is received. The socket assembly includes circuit support means for providing structural support for the flash selecting circuit and protection for the integrated circuit chip, and for facilitating handling of the socket assembly during fabrication thereof and during assembly into an associated photographic camera.

3,745,896

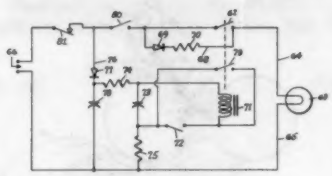
FLASH APPARATUS

George S. Sperti, and Albert E. Gerth, both of Cincinnati, Ohio, assignors to St. Thomas Institute, Cincinnati, Ohio

Continuation-in-part of Ser. No. 672,618, Oct. 3, 1967. This application Oct. 20, 1970, Ser. No. 82,338
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5 R 15 Claims

Flash apparatus for use with camera equipment and the like, comprising a lamp connected across a power source and a cir-

cuit to cause current to flow through the lamp so as to bring the lamp to full brilliance simultaneously with, or immediately prior to, the opening of the camera shutter. The last mentioned circuit may comprise a timing circuit the operation of



which is initiated by a trigger switch. The trigger switch may be built into the flash apparatus or it may be of the remote type. A circuit may also be provided whereby the lamp may be operated at less than full brilliance prior to the opening of the camera shutter.

3,745,897

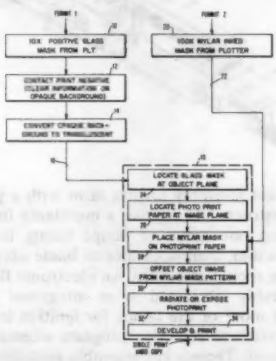
MASK BIT ERROR INDICATOR

William O. Druschel, Granite Springs; Arthur F. Karsch, Yorktown Heights, and William C. Schneider, Jr., Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, New York, N.Y.

Filed June 21, 1971, Ser. No. 155,030

Int. Cl. G03b *29/00*

U.S. Cl. 95—12 **2 Claims**


10X POSITIVE GLASS MASK FROM PLT
100X MYLAR INKED MASK FROM PLOTTER
CONTACT PRINT NEGATIVE (CLEAR INFORMATION ON OPAQUE BACKGROUND)
CONVERT OPAQUE MASK+ GROUND TO TRANSLUCENT
LOCATE GLASS MASK AT OBJECT PLANE
LOCATE PHOTO PRINT PAPER AT IMAGE PLANE
PLACE MYLAR MASK ON PHOTOPRINT PAPER
OFFSET OBJECT IMAGE FROM MYLAR MASK PATTERN
RADIATE OR EXPOSE PHOTOPRINT
DEVELOP & PRINT

Apparatus and method for providing a single hard copy photographic recording indicative of mask manufacturing data errors occurring during the transmission of the data to the manufacturer or during the mask making process. A reproducing means is responsive to binary information of a first format for providing an actual circuit pattern mask for use in fabricating a master mask used in the manufacture of semiconductor devices, and the reproducing means also is responsive to binary information of a second format for providing a reference circuit pattern mask. Optical means superimposes the actual circuit mask pattern with respect to the reference circuit mask pattern so as to provide a resultant pattern representation. Photographic means records the resultant pattern representation and provides a single hard copy chiaroscuro print.

3,745,898

ELECTROSTATIC IMAGE DEVELOPING DEVICE

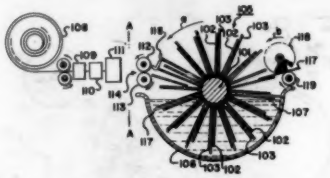
Sadanao Ando, Musashino, and Fumihiro Miyagawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Division of Ser. No. 780,673, Dec. 3, 1968, Pat. No. 3,638,609.

This application June 16, 1971, Ser. No. 153,602

Int. Cl. G03b *17/50*

U.S. Cl. 95—13 **3 Claims**



An electrostatic image developing device provided with a photosensitive copy paper transporting rotary body having a plurality of photosensitive copy paper receiving plates equiangularly radially disposed peripherally of the rotary body whereby the copy papers bearing thereupon electrostatic images are held in position between adjacent receiving plates for developement. The object is to facilitate the photocopying process without reducing a developing time.

3,745,899

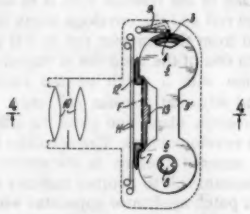
FILM CARTRIDGE

Bernhard Walther, Dessau, Germany, assignor to VEB Filmfabrik Wolfen, Wolfen, Germany

Filed Jan. 6, 1972, Ser. No. 215,821

Int. Cl. G03b *19/04*

U.S. Cl. 95—19 **4 Claims**



A cartridge is formed of a film magazine drum, a film takeup drum and intermediate structure. Each drum contains an arcuate film guide channel. The apertures of these channels, facing one another, define the film gate. One of the guide channels has an aperture to the outside, opposite the perforations of the film passing through the channel.

3,745,900

FILM ASSEMBLAGE

Hubert Nerwin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 52,028, July 2, 1970, abandoned.

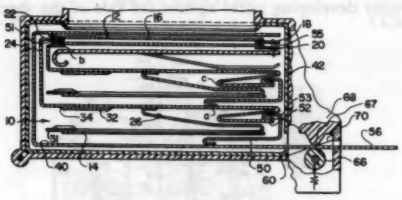
This application Jan. 13, 1972, Ser. No. 217,619

Int. Cl. G03b *19/10*

U.S. Cl. 95—19 **11 Claims**

An assemblage of "self-processing" photographic film units and leaders. The film units include photosensitive and processing elements arranged in separate stacks permitting sequential exposure of the photosensitive elements. The leaders serve to interconnect both the photosensitive and processing elements of each film unit and the respective film units. Only one leader extends from the assemblage at the time of each exposure and this one leader is adapted to be pulled

from the assemblage to superpose the exposed photosensitive elements with its respective processing element, to transport that superposed unit from the assemblage and between a pair



of pressure-applying members, and to advance a leader from the next successive unit to a position between the pressure members where it can be grapsed for superposing and transporting that next successive unit after its exposure.

3,745,901

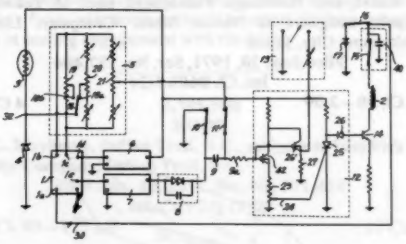
ELECTRICALLY CONTROLLED PHOTOGRAPHIC CAMERA SHUTTER APPARATUS

Seinan Miyakawa, Nobuhiro Noda, both of Tokyo, and Mitsuhiko Shimoda, Niiza, all of Japan, assignors to Asahi Kogaku Kogyo Kabrishiki Kaisha, Tokyo to, Japan

Filed May 9, 1972, Ser. No. 251,721

Int. Cl. G03b *9/58;* **H01f** *7/18;* **H01h** *47/22*

U.S. Cl. 95—53 EB **4 Claims**



A camera capable of automatically determining the exposure time and having interchangeable objectives. One of the factors which determines the extent of exposure is the magnitude of the aperture through which light enters the camera. This factor is introduced either by way of one variable resistor which coacts with an objective which remains wide open and which is automatically stopped down to a preselected aperture just prior to exposure, or by way of a second variable resistor adapted to be used in the situation where the objective is not automatically stopped down just prior to exposure and instead has its diaphragm in a stopped down condition restricting travel of light passing through the objective with this light being measured after passing through the stopped down diaphragm. These variable resistors are connected in parallel and a selecting switch is provided for utilizing one or the other of the variable resistors depending upon the type of objective which is used. In addition, in order to render an electromagnet operative in the shortest possible time, the electromagnet is supplied with power not only from a conventional voltage source but also from a capacitor which is preliminarily charged.

3,745,902

SELF-TIMER CIRCUIT AND SELF TIMER-DEVICE INCORPORATING SAID SELF TIMER CIRCUIT

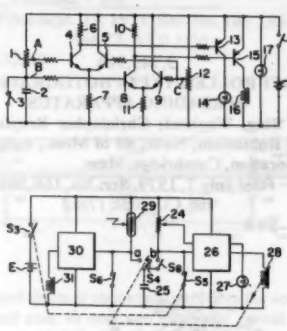
Tetsuya Taguchi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1972, Ser. No. 276,292

Claims priority, application Japan, Aug. 9, 1971, 46/60130

Int. Cl. G03b *9/64*

U.S. Cl. 95—53.3 **5 Claims**



This invention provides a self-timer circuit for a camera including an electronic circuit. The electronic circuit is capable of generating a signal at a predetermined time before the actuation of the timer is completed. To this end, the self-timer device includes a time-constant circuit having resistor and capacitor, a first switching circuit operable between two states in response to a voltage across the capacitor and the output terminal of this switching circuit is coupled to an electromagnet for releasing the shutter, and a display circuit for giving said signal.

3,745,903

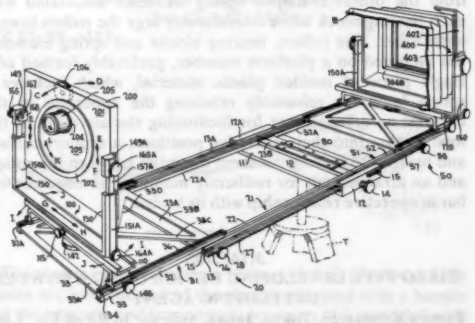
VIEW OR PROCESS TYPE CAMERA

Adolph Studly, R.D. No. 1, Fels Road, Box 74, Pennsburg, Pa.

Filed June 23, 1971, Ser. No. 155,804

Int. Cl. G03b *5/02*

U.S. Cl. 95—51 **12 Claims**



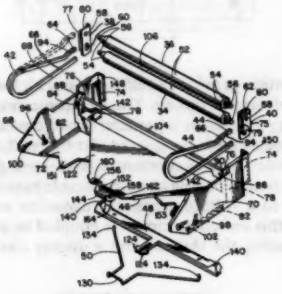
Disclosed is an improved view or process camera characterized by a front, lens carrying section that is larger than the back, film or ground glass carrying section, with appropriately tapered bellows joining the two sections. Additionally, the rear frame section of the camera is flared outwardly in a direction toward the front of the camera in order to accommodate the bellows as it bunches and sags during adjustment of the camera front or back section. This feature allows a much wider range of adjustment of the front and/or back sec-

tion of the camera without allowing the distorted bellows to interfere with the light rays passing from the lens to the film plate. Also disclosed is an improved camera structure allowing a greater degree of freedom in adjusting the components of the camera relative to each other. Also disclosed is an improved lens carrying board with a rotatable lens disc that allows the lens to be adjusted relative to the ground glass or film plate in the camera. Other features disclosed will become apparent from a reading of the following disclosure.

3,745,904
LOW-COST ROLLER-TYPE PHOTOGRAPHIC FLUID SPREADING APPARATUS

Herbert A. Bing, Wayland; Christopher Brayton, Needham, and Leon Rubinstein, Natic, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 7, 1971, Ser. No. 160,364
Int. Cl. G03b *17/52*
U.S. Cl. 95—89 R **24 Claims**



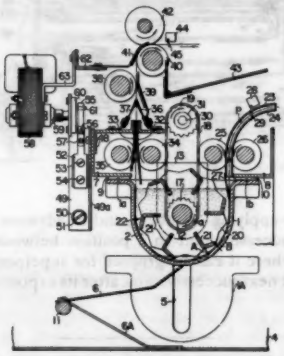
Apparatus for spreading processing fluid between a pair of sheet materials and adapted to be inserted into and removed from a camera as an integral assembly. A pair of rollers are rotatably mounted between spaced apart bearing blocks which serve to establish a predetermined minimum spacing between the facing surfaces of the rollers and to permit a limited amount of displacement of one of the rollers away from the other. U-shaped spring elements associated with each bearing block aerve to resiliently urge the rollers toward each other. The rollers, bearing blocks and spring elements are mounted on a platform member, preferably formed of a single piece of molded plastic material, which includes a spring latch for releasably retaining the apparatus in the camera, an arrangement for facilitating the assembly of the load springs into their operative positions, a support surface and bridge for guiding the sheet materials between the rollers and an arrangement for resiliently mounting an edge control bar in operative relationship with its bridge.

3,745,905
DIAZO TYPE DEVELOPING DEVICE USING A POWDER DEVELOPING AGENT

Yugoro Kobayashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1972, Ser. No. 242,490
Int. Cl. G03d *13/00*
U.S. Cl. 95—89 R **12 Claims**

A developing device using a powder developing agent comprising fine powder and alkaline developing liquid adsorbed on the powder surface. The developing device comprises a trough-shaped developing tray which is semicircular in cross-section and contains a quantity of the developing agent. The leading edge of an exposed diazo type photosensitive sheet is introduced along the curved inner wall of the tray such that the diazo material of the sheet faces the powder in the tray. The powder developing agent in the tray is agitated by uniquely shaped vanes which simultaneously serve to (1) agitate the powder developing agent in the tray, (2) move the sheet introduced in the tray along the inner tray wall, and (3) press powder developing agent against the side of the sheet which

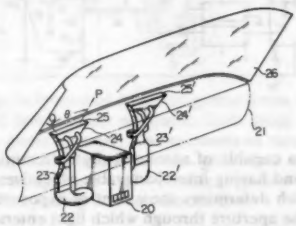


has the diazo type photosensitive material thereon to develop the latent image on the sheet. A control mechanism is provided to turn on the vanes when the leading edge of a sheet is introduced into the tray and to turn off the vanes when the trailing edge of the same sheet is extracted from the tray. Wiper elements also provided for brushing off powder developing agent remaining on extracted sheets, and for replacing or adding to the developing agent in the tray.

3,745,906
DEFROSTER

Jun Kakei, and Hirotsugu Yamaguchi, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed June 28, 1971, Ser. No. 157,404
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.09 **4 Claims**



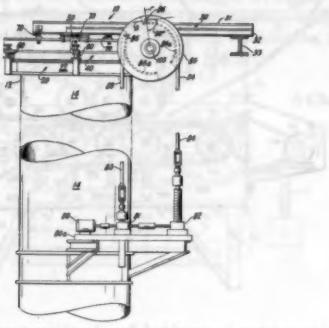
Herein disclosed is a defroster for defrosting a windshield of a motor vehicle. The defroster has a defroster nozzle having a generally rectangular, laterally elongated cross section which is gradually enlarged toward an outlet opening formed at the foremost end of the defroster nozzle. A hot fluid jet is passed to this defroster nozzle and is sprayed onto the windshield through the outlet opening. The path of the fluid jet issuing from the defroster nozzle is periodically switched from one side wall of the defroster nozzle to the other so that the fluid jet is caused to spurt at varying angles in a side-to-side direction. The flaring configuration of the defroster nozzle is useful to provide a wall-attachment effect between the fluid jet and the inner surfaces of the side walls of the defroster nozzle. The windshield is thus defrosted practically throughout its total area, providing a clear frontal viewing from within the motor vehicle.

3,745,907

CLOSURE FOR EXHAUST STACK

James R. Zarfoss, Timonium; Earle S. Snader, Ellicott City, and Elden A. Hale, Sr., Pikesville, all of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed May 17, 1971, Ser. No. 144,025
Int. Cl. F23l 17/02
U.S. Cl. 98—59 1 Claim



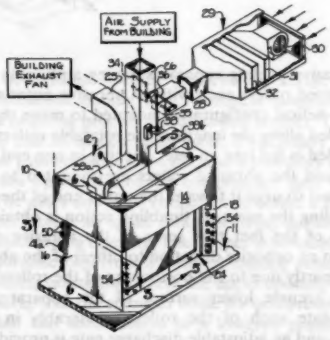
A stack closure for closing the exhaust end of an exhaust stack to prevent the exhaust of gases from the stack and for opening the exhaust end when desired. A pivotable support frame is connected to a base member located at the exhaust end. A cap is connected to the frame by a floating connection for providing random movement between the cap and the frame. The frame pivots to move the cap into and out of closing engagement with the base and the floating connection permits self-alignment of the cap with the base during closing. Resilient stabilizing members act to stabilize the random movement between the cap and the frame. A seal member seals the cap and base, and pressure limiters protect the seal member from excessive pressure exerted thereon when the cap is in sealing engagement with the base.

3,745,908

HOOD

Lee G. Mayberry, Indian Trail, N.C., assignor to MayRich Specialty Company, Indian Trail, N.C.

Filed Aug. 13, 1971, Ser. No. 171,454
Int. Cl. F23j 11/00
U.S. Cl. 98—115 LH 12 Claims



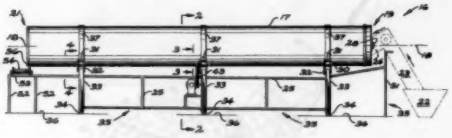
Air is circulated through an area overlying a predetermined portion of a horizontal work surface such as a laboratory table while both enclosing confinement of the area and opening thereof to receive portions of objects supported in part by other portions of the work surface are selectively accommodated by a hood having movable side panels. In another aspect of the invention, a range of selected atmospheric conditions in the area are achieved by controlling the condition of the air being circulated.

3,745,909

CEREAL TOASTING OVEN

Wayne W. Schlotthauer, Paradise, Calif., assignor to Lassen Foods, Inc., Paradise, Calif.

Filed Sept. 23, 1971, Ser. No. 183,163
Int. Cl. A23l 1/10
U.S. Cl. 99—323.9 5 Claims



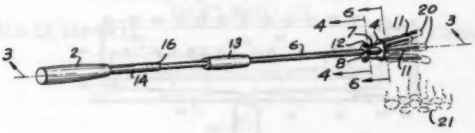
An elongated drum is mounted on rollers for rotation about its longitudinal axis. In order to move the cereal through the oven, the drum axis is inclined somewhat downwardly from a higher end, where the somewhat moist cereal mixture is introduced, to a lower end, where the dried and toasted cereal emerges. Drying and toasting is effected by a gas flame merging from gas pipe extending through the interior of the drum. Adjacent the input end of the drum a scraper blade is suspended from the gas pipe to within a fraction of an inch from the drum's inside bottom wall so as to dislodge any still moist cereal from adhering to the drum's inside wall. The scraper ends at a location where the cereal is sufficiently dry so that the tendency of the cereal to adhere to the wall no longer obtains. From this location to the outlet end of the drum, longitudinal ribs are provided to tumble the cereal and thereby equally toast the cereal throughout as the cereal advances through the rotary drum toward the discharge end.

3,745,910

ROASTING SPIT

William B. Delamater, 9114 Valley View, Whittier, Calif.

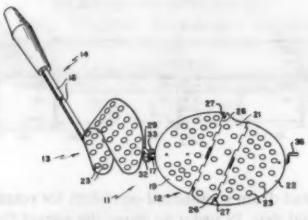
Filed Jan. 4, 1972, Ser. No. 215,298
Int. Cl. A47j 37/04
U.S. Cl. 99—419 6 Claims



The roasting spit includes an elongated shaft of substantially square section, one end of the shaft is provided with a handle and the opposite end transversely secures a disk provided with transverse perforations adjacent the rim thereof. A round sleeve is slidable upon the square shaft, the sleeve provided with a handle for moving the sleeve, the opposite end of the sleeve being square sectioned and provided with a central disk of smaller diameter than the disk secured to the square shaft. A further sleeve is secured to the shaft handle and telescopically receives the round sleeve. Tines are secured to the small diameter disk and project through the perforations of the larger disk whereby the round sleeve handle is moved forwardly the tines flare beyond the larger disk, the tines being

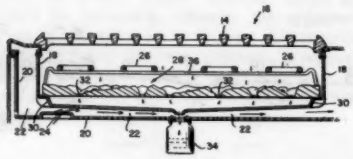
drawn inwardly of the larger disk when the sleeve handle is moved toward the shaft handle. Thus various food items such as wieners, may be impaled upon the tines whereby the food article may be roasted over a fire, the food articles being released from the tines when the sleeve is moved by its handle to retract the smaller diameter disk and to retract the tines.

3,745,911
COOKING UTENSIL
William D. Kennedy, Jr., P.O. Box 398, Colonial Heights, Va., and Lawrence G. Gunn, 5308 Pender Ct., Alexandria, Va.
Filed Oct. 22, 1971, Ser. No. 191,917
Int. Cl. A47j *43/18*
U.S. Cl. 99—426 **7 Claims**



A utensil for forming and cooking a tortilla including a perforated multi-section outer plate, said sections being pivotally inter connected; a handle; means for rigidly attaching one of said sections to said handle to support said multi-section outer plate in an open, substantially flat position to receive a tortilla; and a perforated U shaped inner plate pivotally attached to said handle for performing the tortilla into a taco shell when said outer plate is secured to said inner plate. The inner and outer plates may be provided with grooves within their respective interfaces inter connecting said perforations. A cavity may be provided within the inner plate for receiving a food substance to be cooked within and simultaneously with said taco shell.

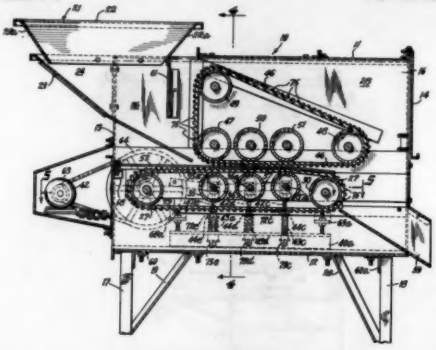
3,745,912
BROILER WITH HEAT SINK MEANS
Thomas R. Field, Indianapolis, Ind., assignor to Jenn-Air Corporation, Indianapolis, Ind.
Filed Mar. 16, 1972, Ser. No. 235,203
Int. Cl. A47j *35/00, 37/00*
U.S. Cl. 99—446 **12 Claims**



An indoor open-air broiler having a heat sink in the form of a plate, with openings therethrough, adapted to underlie heating elements and grill and disposed above the grease drip pan so that greases and drippings falling thereon, after partial vaporization, pass on through to the drip pan. The plate has an upper surface of hills and valleys (preferably black) facing the heating elements, and a bottom surface (which may be smooth) facing the drip pan.

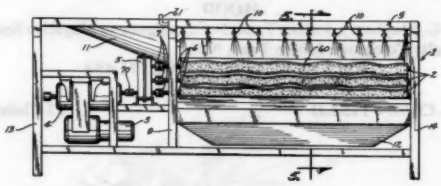
The plate absorbs heat from the heating elements and because of its upper surface maximizes heat emittance back towards the grill while minimizing heat emittance downwardly towards the drip pan.

3,745,913
SHUCKER
Oliver K. Hobbs, 120 Elm St., Suffolk, Va.
Filed Apr. 16, 1971, Ser. No. 134,747
Int. Cl. A23n *5/08*
U.S. Cl. 99—625 **8 Claims**



An apparatus is provided for shucking pecan bollies and similar nuts which has a pair of continuous belts disposed one over the other in face to face relationship and rotated in opposite directions between spaced pairs of idler rollers. One roller of each pair is adapted to move vertically and respond to pressure of nuts passing between the pair to provide for sufficient compression to break the shucks but to avoid cracking of the nut shell.

3,745,914
ABRASIVE PEELING APPARATUS
Joseph E. Wallace, Creston, Iowa, assignor to Vanmark Corporation, Creston, Iowa
Filed Oct. 27, 1971, Ser. No. 193,134
Int. Cl. A23n *7/00*
U.S. Cl. 99—630 **14 Claims**



An abrasive peeling apparatus having a plurality of rotatable elongated rollers each with an abrasive outer surface including a helical configuration adapted to move the material to be peeled along the length of the rotatable rollers. Material to be peeled is fed into an inlet opening in one end of the apparatus, and the abrasive rollers are mounted to carry the product and to urge it toward the outlet end of the apparatus while peeling the same. A tumbling action is obtained partly by virtue of the fact that some of the abrasive rollers are spiraled in an opposite direction to others of the abrasive rollers, and partly due to the positioning of the rollers to form a generally arcuate lower surface of the apparatus. Driving means rotate each of the rollers, preferably in the same direction, and an adjustable discharge gate is provided to control the depth of the load and consequently the peeling force on the abrasive surfaces. Quick-release mounting means are included for mounting the end of the rollers opposite the driving end.

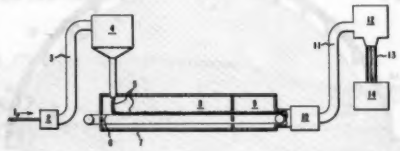
Each of the rotatable abrading rollers are mounted on a central shaft therethrough, and include an opening conforming to the size and shape of the central shaft. The abrading roller may include a plurality of smaller members in abutting end-to-end relationship to form a continuous abrading surface throughout the length of the roller.

3,745,915

PROCESS FOR HOT BALING ACRYLIC STAPLE

Frederick George William Rehm, Jr., Camden, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 30, 1971, Ser. No. 185,253
Int. Cl. B30b *9/30, 15/30*
U.S. Cl. 100—38 **6 Claims**



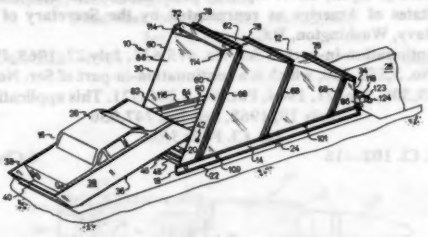
An improvement in the process of preparing bales of dry-cut acrylic staple fibers from dried multifilament acrylic tow. The improvement comprises heating the cut fibers to a temperature of 45°–100°C. with heated air after they are cut but just prior to entry into the baler. Such heating provides a bale having a density greater than if the fibers had not been so heated. Thus, more staple fibers can be packed into a bale using this improvement.

3,745,916

SCRAP PROCESSING MACHINE

George C. Patros, La Crosse, Wis., assignor to Kar-Denser, Inc., La Crosse, Wis.

Filed Feb. 17, 1972, Ser. No. 227,493
Int. Cl. B30b *15/30*
U.S. Cl. 100—215 **6 Claims**



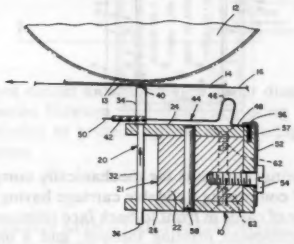
A scrap processing machine for crushing scrap, such as stripped automobile bodies, into rectilinear laminated slabs comprises a crushing process and a loading hopper. The press comprises a pair of spaced apart walls, a stationary inclined compression gate between the walls, and a pivotably movable hydraulic ram operated inclined compression gate between the walls. The gates and walls cooperate to define a compression chamber having an upper scrap receiving opening and a lower slab discharging opening. The hopper is pivotably movable by a hydraulic ram from a lowered loading position to a raised unloading position adjacent the upper opening wherein it deposits scrap into the chamber while the compression gates are separated and then returns to a lowered position. The scrap is crushed into a slab by closing movement of the movable compression gate. Opening movement of the latter gate allows the slab to slide out of the press through the lower opening under the force of gravity. A motor driven slab ejector drum adjacent the lower opening ssists in removal of the slab. The corners of the compression chamber formed by the side walls and the stationary gate are provided with fillets which prevent scrap from being jammed into those corners. The surface of the movable gate has spaced apart parallel members along its side edges which cooperate with the fillets to force the scrap inward and further prevent the slabs from lodging between the movable gate and side walls.

3,745,917

DIGITAL PRINTER HAMMER ASSEMBLY

James J. Cavella, Philadelphia, Pa., assignor to Datadyne Corporation, King of Prussia, Pa.

Filed June 16, 1971, Ser. No. 153,685
Int. Cl. B41j *9/10, 1/48*
U.S. Cl. 101—93 C **14 Claims**



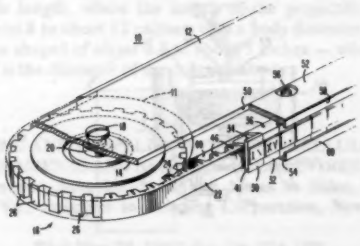
A hammer assembly for use in on-the-fly type digital printers. A central block portion has top and bottom hammer retaining plates extending outwardly in overhanging fashion from said block to receive hammer aligning pins in aligned apertures in the plates. Each of the hammer aligning pins has connected to it a spring beam member with a loop which elongates as the hammer is thrust upwardly from the block assembly when actuated, said loop recoiling as the spring biases the hammer pin assembly back to its resting position.

3,745,918

WIDE BASE TYPE CARRIER

Francis J. Perry, Endicott, and Guenther H. Schacht, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1971, Ser. No. 211,439
Int. Cl. B41j *1/20*
U.S. Cl. 101—111 **4 Claims**

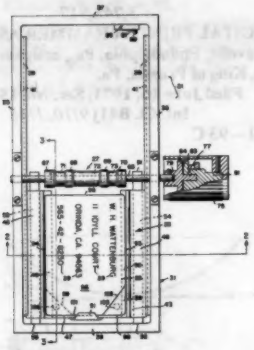


A plurality of type carriers of U-shaped configuration are provided with legs of increasing width which overlap the legs of the adjacent type carriers to provide stability and close spacing of type characters between adjacent type carriers.

3,745,919
RECORD CARD COMPARING AND PRINT ENABLING MECHANISM

Willard Harvey Wattenburg, and John P. Glass, both of c/o Cava Industries, 79 La Grange Avenue, Essington, Pa.

Filed Aug. 26, 1971, Ser. No. 175,074
Int. Cl. B41f *3/00, 1/66;* G06k *9/00*
U.S. Cl. 101—269 11 Claims

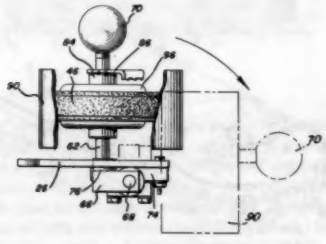


Card comparing apparatus for mechanically comparing an embossed card comprising a slidable carriage having a seat for receiving a pair of cards in front to back face relationship, said cards having embossed printing thereon, and a mechanical mechanism for detecting any difference in the embossed printing. One detecting mechanism senses the difference in the combined thickness of matched cards and mismatched cards, and includes a pair of rollers spaced apart a distance sufficient to pass a pair of matched cards and to block passage of a pair of mismatched cards. Another detecting mechanism includes a pair of rollers for sliding mismatched cards in opposite directions. The embossed printing on the cards is from a printing font having printing elements which nest only with identical elements in the font and do not nest with any other elements. The embossed printing elements have rounded raised portions permitting closer nesting than embossed printing having raised portions with flat tops and side portions angled away therefrom.

3,745,920
PIVOTABLE INKING DEVICE WITH GUARD MEANS FOR CODE DATING APPARATUS

James G. McKay, Chicago, Ill., assignor to Kiwi Coders Corporation, Chicago, Ill.

Filed June 24, 1970, Ser. No. 48,984
Int. Cl. B41f *31/00*
U.S. Cl. 101—329 9 Claims

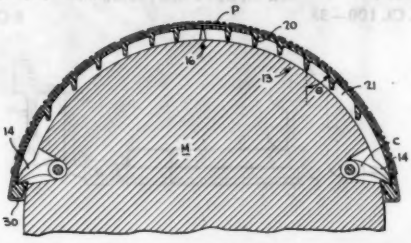


For use in a rotary printing apparatus for marking individual packages moving in a line past a rotary printing member, a rotary inking device mounted upon said apparatus and including a rotary inking wheel and guard means therefor together being mounted for selective pivotal movement, on a pivot axis offset from the axis of the rotation of the printing member, between an operating condition aligned with said printing member and an inoperative condition offset from said alignment, stop means being provided for limiting the said pivotal movement.

3,745,921
PRINTING PLATE SADDLE WITH LIVING HINGE

Stanley W. MacDonald, and George Mottl, both of 402 South Cass Avenue, Westmont, Ill.

Filed Mar. 7, 1972, Ser. No. 232,422
Int. Cl. B41f *27/06*
U.S. Cl. 101—378 8 Claims

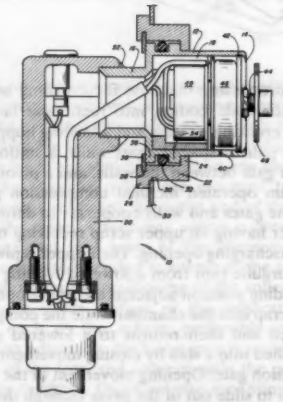


A lightweight plastic saddle for mounting of thin shell printing plates is provided. The body of the saddle is provided with waffle ridging consisting of longitudinal runners and angled cross ribs to reinforce the curved body. The ribs are angled progressively greater toward the ends to provide the necessary draft when the saddle is removed from the forming mold, but without sacrificing reinforcement of the supporting runners when the saddle is mounted on a printing cylinder. The runners are provided with an interruption and the body with a rounded groove at the center of the saddle to form a living hinge across the saddle to permit initial mounting, stretching and holding of the plate and easy installation on the cylinder.

3,745,922
DESTRUCTOR STERILIZER

Robert J. Lyon, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 475,631, July 27, 1965, Pat. No. 3,559,580, which is a continuation-in-part of Ser. No. 339,308, Jan. 21, 1964, Pat. No. 3,205,321. This application July 19, 1968, Ser. No. 747,036
Int. Cl. F42c *3/00*
U.S. Cl. 102—16 6 Claims



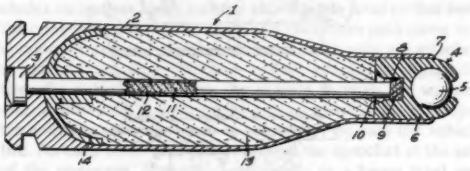
For use with an underwater ordnance device having a water tight casing, a main weapon battery, and a firing device

responsive to a predetermined decrease in voltage, a sterilizer including: a sea water battery positioned inside the casing and connected in oppsition to the main weapon battery; a pair of normally open stationary contacts connected across the main weapon battery; an electrolytically timed switch for closing the contacts; and a movable sealing plug responsive to the electrolytically timed switch to flood the ordnance device.

3,745,923
TRAINING CARTRIDGE

Andrew J. Grandy, North Hills, Pa., assignor to The United Stats of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 16, 1971, Ser. No. 199,201
Int. Cl. F42b *5/22, 13/20*
U.S. Cl. 102—41 **4 Claims**

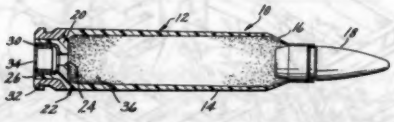


A non-lethal cartridge comprising a primary charge, a secondary charge and a projectile which consists of a B–B ball shot encased in a plastic carrier. A shielded detonating cord extends axially between the cartridge's primer and the primary charge which is located in the base of the carrier. When the primer is initiated, the primary charge is ignited through the cord to drive the carrier and the B–B through the muzzle of a firearm. Vents in the carrier initiates the ignition of the secondary charge to generate sufficient gas pressure to cycle the firearm.

3,745,924
PLASTIC CARTRIDGE CASE

John J. Scanlon, Monroe, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Mar. 30, 1970, Ser. No. 23,861
Int. Cl. F42b *5/30*
U.S. Cl. 102—43 P **7 Claims**

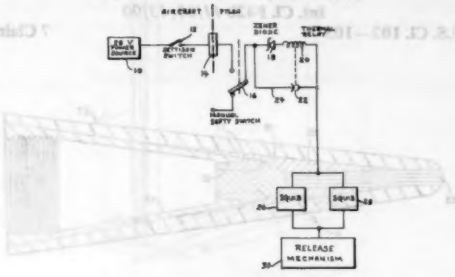


A plastic cartridge whose ballistics are equivalent to existing metallic cartridges and which can be fired in existing firearms. A non-expanding metal head is securely attached to the breech end of the plastic casing by compressively squeezing the rear end of the plastic casing between a metal head and a second metallic member, either an annular support member plus a primer or by the primer itself. The plastic casing is preferably formed by drawing at least the front end of the casing and then necking down the mouth portion. The preferable plastic materials for cartridge casings include polycarbonates, polysulfones, and blends of plastics, e. g. a blend of polyethylene and polycarbonate, a blend of polyethylene and polysulfones, and alloys of polysulfones and polycarbonates.

3,745,925
TEMPERATURE AND VOLTAGE CONTROLLED CIRCUIT

Sam R. Hester, Jr., 814 Tarpon Drive, Fort Walton Beach, Fla.

Filed June 22, 1971, Ser. No. 155,568
Int. Cl. F42b *5/08, 9/08*
U.S. Cl. 102—70.2 R **1 Claim**

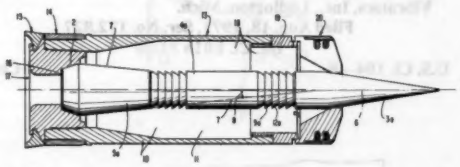


A control circuit incorporating a Zener diode and thermal relay in series between the circuit activating control switch and the device to protect against stray voltages at extreme temperatures.

3,745,926
SABOT SPIN-STABILIZED PROJECTILE

Dale H. Mertz; Alfred A. Loeb, both of Dover, and Edmund W. Falkowski, Port Jervis, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 21, 1971, Ser. No. 154,797
Int. Cl. F42b *13/16*
U.S. Cl. 102—93 **5 Claims**



In a preferred embodiment, a sabot-type spin-stabilized artillery projectile tapering from a pointed nose to a larger-diameter body of columnar shape continuous with a flare base of circular cross-section, the flaring base flaring preferably at a flare angle of between about 4.5° to about 9°, the length of the flaring base as measured along the projectile's longitudinal axis ranging from preferably about 8 to about 22 percent of projectile length, where the length of the projectile ranges from about 8 to about 12 calibers with a body diameter (of the columnar shape) of about 0.8 to about 3 inches — where a "caliber" is the diameter of the columnar body.

3,745,927
CASING AND PROPELLANT OF NITROCELLULOSE FILAMENTS AND NITROCELLULOSE FIBERS

Ernst Tanner, Asheville, N.C., and James R. Sides, Fairfax City, Va., assignors to Celanese Corporation, New York, N.Y.

Filed May 20, 1969, Ser. No. 826,109
Int. Cl. F42b *5/16*
U.S. Cl. 102—103 **7 Claims**

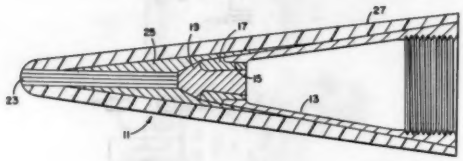
Autocombustible structural members for space vehicles, for example rocket casings and propellant grains, formed and reinforced with autocombustible nitrocellulose filaments.

3,745,928

RAIN RESISTANT, HIGH STRENGTH, ABLATIVE NOSE CAP FOR HYPERSONIC MISSILES

Laird D. Kinnaird; Seth B. Moorhead, Jr., and James L. Casadevall, all of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 3, 1971, Ser. No. 204,591
Int. Cl. F42b *11/00, 13/00*
U.S. Cl. 102—105 7 Claims



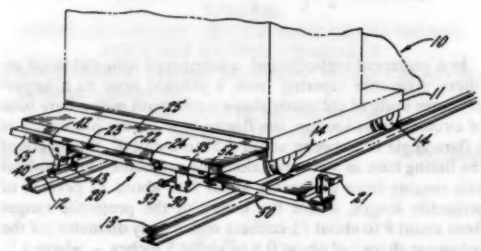
An ablative nose cap for slender type missiles in which the nose cap has a base member for securing the nose cap to the missile proper, an insulation member at the head end of the base member, a back-up nose tip mounted relative to the insulation member, a unidirectional fiber rod in front of the back-up tip and an outer wrap of reinforced phenolic about the outer surfaces of the several members to provide an outer ablative cover. The nose cap is designed for hypersonic speeds and for maintaining its structural and thermal integrity after particle impact encounters with rain, ice or dust at hypersonic velocities.

3,745,929

RAIL FOLLOWER ASSEMBLY

La Verne W. Root, Ludington, Mass., assignor to Jackson Vibrators, Inc., Ludington, Mich.

Filed Aug. 18, 1971, Ser. No. 172,827
Int. Cl. E01b *35/00*
U.S. Cl. 104—8 4 Claims



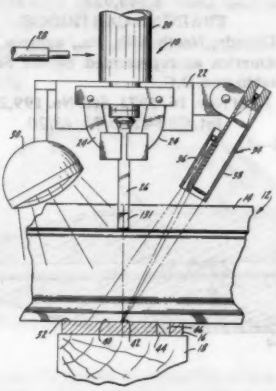
A rail follower assembly for track working equipment in which the reference device to be held in laterally fixed relation to a rail is mounted on a bar suspended by a pair of parallel links holding the bar above and parallel to the track. The bar carries an arm supporting a rail following roller that can be positioned against the side of a rail head when the bar is swung up and away from that rail head so that the weight of the bar holds the roller against the rail and establishes the fixed lateral spacing between the rail and the reference device. A pair of roller carrying arms are provided on the bar so that either rail can be engaged, and both arms can be locked in raised position so that the bar will hang well clear of the rails for on-track travel of the equipment.

3,745,930

AUTOMATIC HOLE FINDER FOR SPIKE DRIVER

Andrew M. Dieringer, Waterford, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 805,780, March 10, 1969, abandoned. This application June 7, 1971, Ser. No. 150,820
Int. Cl. E01b *29/26*
U.S. Cl. 104—17 R 13 Claims



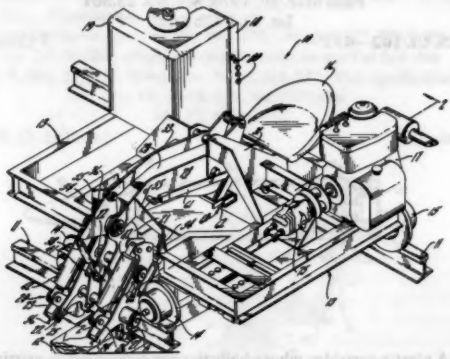
This is a method and apparatus for finding the hole in a tie plate by the use of reflected light and automatically driving the spike through the hole to secure the rail and tie plate to the tie so that operator error in spiking railroad track is eliminated.

3,745,931

RAIL ANCHOR APPLYING MACHINE

Simon S. Izdebski, Ludington, Mich., assignor to Jackson Vibrators Inc., Ludington, Mich.

Filed Aug. 9, 1971, Ser. No. 170,128
Int. Cl. E01b *29/32*
U.S. Cl. 104—17 A 6 Claims



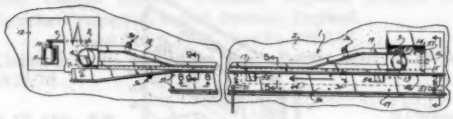
A rail anchor applying machine having an independently movable transfer holder for transferring rail anchors to an applicator assembly which applies the rail anchors to the base of a rail against the sides of a crosstie while a toggle assembly applies a reaction force to the machine's frame which is transmitted through the wheels of the machine to the rail to insure that the alignment of the rails is not disturbed by application of the anchors to the rail. The separate transfer holder is loaded by the operation during application of the anchors and transfers anchors to the applicator assembly during indexing of the machine.

3,745,932

CONVEYOR FOR VEHICLE WASHING UNIT

Gerald E. Czerwinski, 2532 Buchanan Road, Kenosha, Wis.

Filed June 23, 1971, Ser. No. 155,879
Int. Cl. B61b 13/12; B65g 19/22
U.S. Cl. 104—172 B 14 Claims



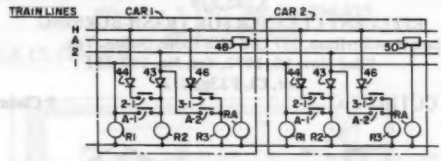
A conveyor for a vehicle washing system. The conveyor includes an endless chain located above grade level so that both the conveying path of the chain and the return path move in a common horizontal plane. A series of roller units are attached at spaced intervals to the chain and are adapted to engage the tire of a vehicle to convey the vehicle through the washing unit. A provision is made at the entrance end of the conveyor for enabling the roller units to selectively by-pass the vehicle tire. As each roller unit passes around the sprocket at the end of the conveyor, it pivots downwardly to a lower level and rides at the lower level beneath the tire to by-pass the same. When it is desired to have the roller unit engage the vehicle tire, a ramp or plate is pivoted upwardly and the roller unit will ride upwardly on the ramp to the upper level in position to engage the tire and convey the vehicle through the washing unit.

3,745,933

CONTROL SYSTEM FOR INDIVIDUALLY DRIVEN VEHICLES IN A TRAIN OF SUCH VEHICLES

Hermann Eisele, Nellingen, Germany, and Robert R. Lewis, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 29, 1971, Ser. No. 167,140
Int. Cl. H02p 1/58; B60l 15/32
U.S. Cl. 105—61 11 Claims



Control system for trains of the type in which each car in the train is powered by its own drive motor means (e.g., a commuter train). Cars are addressed individually by train lines including an advance control train line which facilitates picking up an advance relay in each car successively by increasing the voltage on the advance train line in steps. The system minimizes the number of required train lines while insuring smooth acceleration and deceleration of the train.

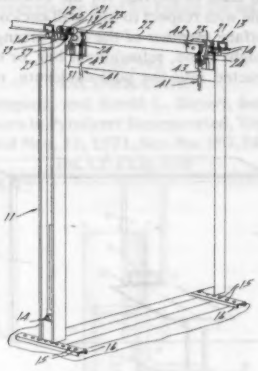
3,745,934

TROLLEY ARRANGEMENT FOR FREIGHT BRACING BULKHEAD ASSEMBLY

Gerald H. Williams, Detroit, Mich., assignor to Evans Products Company, Plymouth, Mich.

Filed Sept. 1, 1971, Ser. No. 176,974
Int. Cl. B60p 7/14
U.S. Cl. 105—376 8 Claims

A freight bracing bulkhead assembly embodying a low profile trolley shaft and an arrangement for driving the bulkhead along the overhead supporting rails and for precluding disengagement of the timing shaft with the rails.

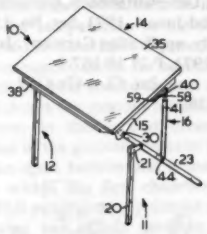


3,745,935

FOLDABLE TABLE

James Bruce Douglas, 5840 McLynn Avenue, Montreal 252, Quebec, Canada

Filed Apr. 17, 1972, Ser. No. 244,648
Claims priority, application Canada, Jan. 28, 1972, 133372
Int. Cl. A47f 5/12
U.S. Cl. 108—1 7 Claims



A foldable drafting table having front and rear legs pivotally connected together and a drawing board pivotally connected to the legs, and also including adjustable spacing means interconnecting the legs and the board for holding the board in a variety of sloping positions, and in which the adjustable spacing means is demountable to allow folding of the board flat against the legs. The leg assemblies at opposite sides of the board are preferably pivotally mounted with respect to each other, to allow the table to stand steadily on an eneven floor, and the leg assemblies are preferably interconnected by a shaft which allows such pivotal movement but which resists side sway of the legs. The adjustable spacing means is preferably a telescopic arrangement of inner and outer tubes having clutch means such as are described in Canadian Pat. application No. 109,344 filed April 1, 1971.

3,745,936

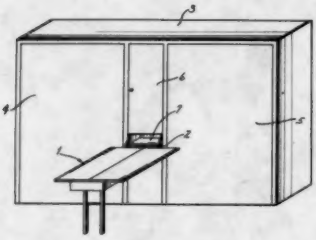
MULTI-FUNCTIONAL TABLE ARRANGEMENT

Hilliard D. Bennett, 1318 Central Avenue, Hot Springs, Ark.

Filed July 28, 1969, Ser. No. 845,257
Int. Cl. A47b 5/06
U.S. Cl. 108—48 6 Claims

In a multi-functional table arrangement for use in combination with some form of wall enclosure or other housing, a table formed having a substructure which includes means for supporting a leg assembly in the forward portion of the table, and

a pair of longitudinal slides connecting at their forward ends with the table substructure and within the wall enclosure at their rearward ends to provide for the extension or contraction of the table with respect to said wall enclosure or housing. The top or surface member of the table arrangement may be utilized as a night stand, refreshment bar, or desk when said table is contracted into the wall enclosure, or may be em-



ployed as a table for dining, a conference, or the like, when the table arrangement is extended from the wall enclosure; and the table top or surface member may also be adapted for unfolding into a larger size planar surface so as to provide greater area when utilized as said table. Lateral slides interconnect within the table substructure and to the underside of the table top so as to provide for the centralizing of said top when maintained in this unfolded relationship.

3,745,937

FOLDABLE CHAIR

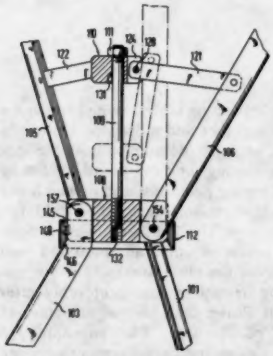
Josef Gail, 8891 Unterwittelsbach, Germany

Filed June 4, 1971, Ser. No. 150,130

Claims priority, application Germany, June 9, 1970, P 20 28 381.2; Mar. 3, 1971, P 21 10 187.1

Int. Cl. A47c *4/30*

U.S. Cl. 108—128 **4 Claims**



A foldable chair having three lower rods and three upper rods pivoted to a center part. A canvas seat is attached to the upper rods, and the lower rods engage the ground in the operative position of the chair. A rod vertically sliding in the center part is connected to the upper and lower rods for unfolding the chair and carries a cup-like locking head at its lower end. The rim of the locking head engages hooks on the lower rods to hold the same in the operative position, and locking rods connect the upper rods to a pivot head on the upper part of the sliding rod. Movement of the pivot head away from the center part is limited by an abutment on the slinding rod, thereby determining the operative position of the upper rods.

3,745,938

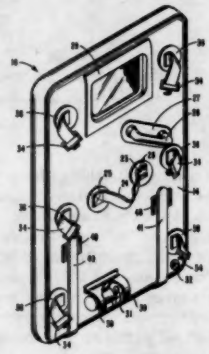
COMPACTIBLE PROTECTIVE SHIELD

Bruce E. Hathaway; Earl W. Huffman, both of Richwood, W. Va., and Kevney J. O'Connor, Newport Beach, Calif., assignors to R. F. Inc., Grantsville, W. Va.

Filed Aug. 3, 1971, Ser. No. 168,565

Int. Cl. F41h *5/08*

U.S. Cl. 109—49.5 **6 Claims**



A protective shield for personnel use is provided that can be rolled into a relatively small, light weight and unobtrusive cylinder, but can be inflated to serve as a unitary shock absorbing and object deflecting shield. The inflatable structure has a generally rectangular outline, and substantially parallel front and rear broad faces of impregnated pile fabric that are relatively pliant when uninflated but substantially flat as well as stiff when inflated. A manually actuable gas cartridge device and handles are attached to the rear face of the shield, which also may include a viewing aperture covered by a foraminous member. The inflated shield provides differential distortion between the front and rear faces under impacting objects, sufficient to protect a person behind the shield by absorbing, distributing or redirecting the force of impact without significant deformation or collapse.

3,745,939

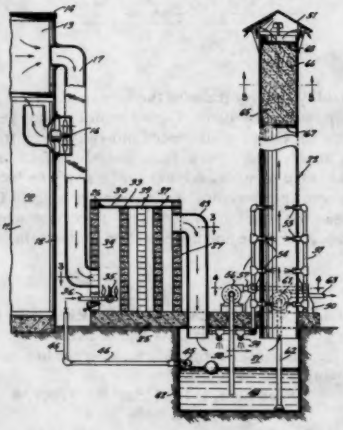
EFFLUENT CLEANER FOR TRASH-BURNING

William R. Allbritton, 257 Old Mill Lane, Dallas, Tex.

Filed Nov. 10, 1971, Ser. No. 197,351

Int. Cl. F23g *5/12*

U.S. Cl. 110—8 A **9 Claims**



Located adjacent to a trash-burning building, such as a building in which flammable material is burned from automo-

biles, effluent cleaning apparatus includes a secondary furnace for burning combustible gases and a tortuous horizontal flue, a water pit in a reversing flow path for collecting particles, washing sprays within the water pit and within a discharge stack, and a mechanical filter in the discharge stack.

3,745,940

FLUIDISED BED APPARATUS AND METHOD

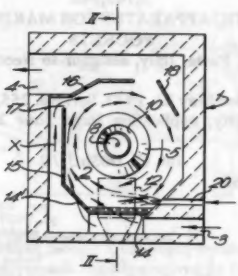
Sydney George Hibbert, Durham, England, assignor to Sprocket Properties Limited, Durham, England

Filed Dec. 6, 1971, Ser. No. 205,167

Claims priority, application Great Britain, Dec. 7, 1970, 57,928/70

Int. Cl. F23g 5/00

U.S. Cl. 110—8 R 8 Claims



Fluidised bed apparatus is described in which the fluidising gas is admitted so as to set up a recirculation of solid matter in a chamber through successive zone in which the material is successively unfluidised, fluidised, suspended, and finally recirculated by a secondary air stream across the top of the unfluidised zone. An embodiment of the apparatus as a refuse incinerator is described, comminuted refuse being fed into the bed material within the apparatus.

3,745,941

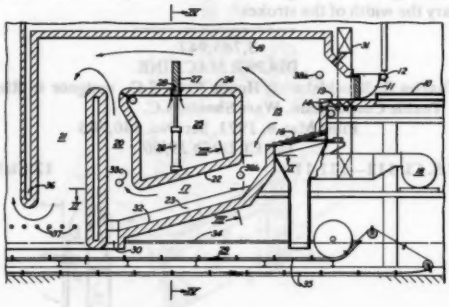
SLAGGING REFUSE INCINERATORS

Bertram B. Reilly, 17 Briar Cliff Road, Ben Avon Heights, Pa.

Filed Dec. 3, 1971, Ser. No. 204,629

Int. Cl. F23g 5/00

U.S. Cl. 110—8 R 5 Claims



My invention relates to a method and apparatus for incinerating refuse including the steps of fusing the ash and metallic content of the refuse and quenching the fused material in water to reduce the solid waste discharge to a granular slag for disposal. The apparatus comprises a primary incinerating furnace operated at conventioal incinerating temperature and a slagging furnace in series. The slagging furnace operates at a higher temperature to complete combustion of residual combustible material and to fuse the solid residue. In this apparatus the flues are arranged to provide parallel flow of portions of the flue gas from the primary furnace, one portion passing overhead at relatively low temperature and the other portion passing through the slagging furnace to supply the oxygen to generate the heat for fusing the solid residue.

3,745,942

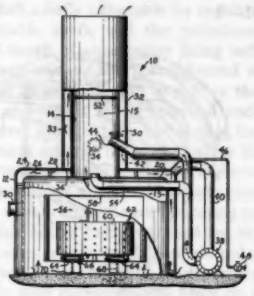
INCINERATOR

Stanley P. Thompson, and David L. Boyert, both of Topeka, Kans., assignors to Pyrolyzer Incorporated, Topeka, Kans.

Filed Nov. 11, 1971, Ser. No. 197,748

Int. Cl. F23g 5/00

U.S. Cl. 110—8 R 14 Claims



An incinerator for combustible materials utilizes direct heating distillation to convert the material to a gaseous state after which the gaseous material is directed upwardly past a heat source which functions as an afterburner. A first chamber receives the combustible material while a second chamber disposed above the first chamber houses the heat source. The heat source raises the temperature in the first chamber to achieve conversion of the material to a gaseous state either by partial combustion or vaporization. An aspirator tube located immediately beneath the heat source creates an area of negative pressure which draws the gaseous material upwardly into the second chamber. In the second chamber essentially complete combustion of the gaseous material takes place. The first chamber has an open bottom and is movable vertically upon the pressure within the first chamber exceeding the design maximum. This minimizes any danger of damage from explosion by allowing any excess pressure to be relieved through the open bottom. The combustible material is contained by a basket in the first chamber which basket is mounted on rollers and is movable along a track to and from the interior of the chamber.

3,745,943

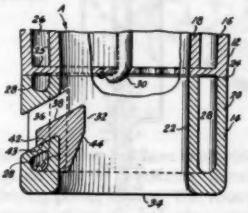
BAFFLE NOSE TUYERE

Willard D. Nothstein, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 31, 1972, Ser. No. 240,057

Int. Cl. F23c 7/00

U.S. Cl. 110—182.5 8 Claims



An improved tuyere which minimizes under nose burning, and which is suitable for blast furnaces is disclosed. The nose

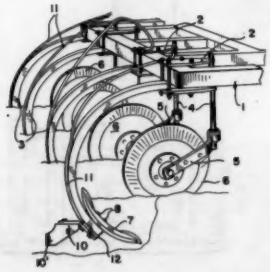
section of the tuyere is provided, on its underside, with a slot for the passage of part of the gases flowing through the tuyere and a deflecting means projecting into the tuyere bore for diverting gases into the slot.

3,745,944

COMBINED LIQUID FERTILIZER DISPENSER AND SOIL COMPACTING AND SEALING DEVICE FOR CULTIVATORS

Harry G. Yetter, Colchester, and Herbert Baughman, RFD, Vermont, both of Ill.

Filed Aug. 30, 1971, Ser. No. 175,859
Int. Cl. A01c *23/02*
U.S. Cl. 111—7 **7 Claims**



A combined liquid fertilizer dispensing and soil compacting device for cultivators as for example, chisel plows, shovel plows, etc., wherein liquid nitrogenous fertilizer, i.e., anhydrous ammonia is supplied from a suitable source to and flowed through tubing secured and extending longitudinally of and along the trailing side of an earth-working chisel or shovel plow carrying shank to a depth below that of the soil surface level being cultivated where it is anchored thereto and discharged thereinto and diffused therethrough thus fertilizing the tilled soil which is thereupon firmly compacted and sealed by means of a shank pivotally connected and drawn member, thus preventing the loss of its efficacy by osmosis and evaporation.

3,745,945

GARDEN SEEDER

Joseph G. Wilson, 15 Weston Hill Road, Riverside, Conn.

Filed June 23, 1971, Ser. No. 156,009
Int. Cl. A01c *5/02*
U.S. Cl. 111—96 **7 Claims**

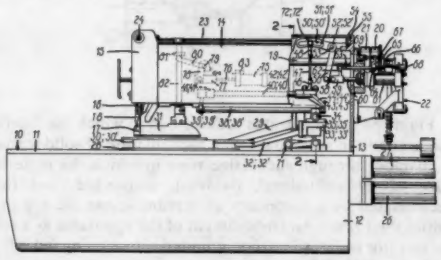
A manually operated seeder and gardening device has a storage hopper for seeds with a tubular member projecting downardly from the hopper and a second tubular member slideable in the first tubular member. A conical end on the slideable tubular member has an opening therein to permit the passage of seed from the storage hopper through openings in the fixed member into the openings in the slideable tubular member and out of the conical end to be deposited in a hole in the earth made by pressing the conical end into the earth. The arrangements of parts and relative sizes is such as to meter the seed to be deposited. The slideable tubular member has a spiral slot through which passes a fixed transverse pin so that axial movement of the slideable tubular member causes its rotation. A soil backfilling device on the conical end of the second tubular member fills the hole into which a seed has been placed upon the rotation of the second tubular member when the hopper is lifted and the second tubular member is urged outwardly by a spring. One form of the invention also can serve as a weeder.

3,745,946

AUTOMATIC APPARATUS FOR MAKING WELTED POCKETS

Nereo Bianchi, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed May 22, 1972, Ser. No. 255,734
Claims priority, application Italy, June 22, 1971, 42910 A/71
Int. Cl. D05b *3/10*
U.S. Cl. 112—65 **4 Claims**



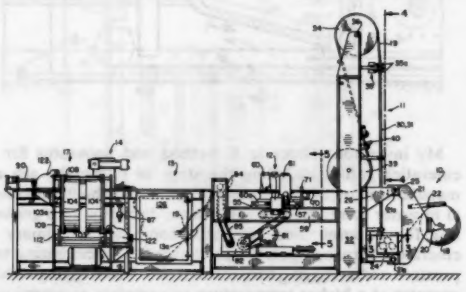
Automatic apparatus for making welted pockets comprising a sewing unit, a work plate slidable along a longitudinal axis, a presser work clamp integral with the work plate to which a piece of fabric is fastened, a center blade and two side pressers for clamping a piece of patch fabric onto the main piece of fabric after folding it according to a determined shape, and a lever system including a lever arm having an adjustable effective length for dirving the strokes of said pressers in order to vary the width of the strokes.

3,745,947

DIAPER MACHINE

Charles E. Brocklehurst, Honea Path, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Filed May 6, 1971, Ser. No. 140,783
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **12 Claims**



A diaper machine having folding, sewing, cutting, conveyor, and hemming sections which incorporates novel means for

centering during folding, for regulating the overall width during sewing of a center fold and for conveying diaper segments in a novel manner while hemming.

3,745,948

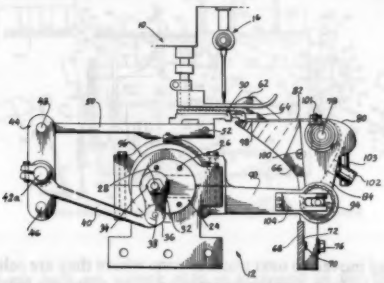
SEWING MACHINE WITH TRIMMING MECHANISM

Sam Desperak, Bayside; Joseph Roschko, Brooklyn, and Max Katz, Flushing, all of N.Y., assignors to Advance Sewing Machine Co. Inc., New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,731

Int. Cl. D05b *37/02*

U.S. Cl. 112—123 **5 Claims**



A sewing machine having a tirmming mechanism which is readily attachable to and readily removable from the sewing machine drive mechanism, without dismantling the sewing machine or disassembling its drive mechanism. The invention comprises the use of an elongated main drive shaft extending from the rotary drive mechanism of the sewing machine to and beyond the reciprocatory needle drive mechanism thereof, and the attachment of the trimming mechanism and the feed dog driving mechanism to said elongated main drive shaft.

3,745,949

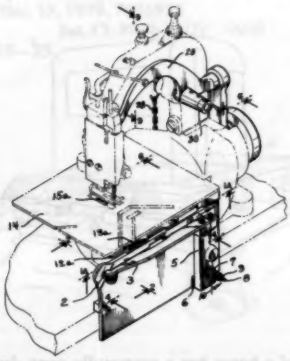
SEWING MACHINE

Joseph Medynski, 18 Park St., Ramsey, N.J.

Filed Aug. 12, 1971, Ser. No. 171,159

Int. Cl. D05b *35/06*

U.S. Cl. 112—152 **7 Claims**



A sewing machine which in the preferred embodiment includes a hinged stretch bar regulatably biased for applying pressure against a fabric being fed through centralizing slots in a vertical face plate, the bar having an angular side serving to centralize the strip fabric within the slots such that the fabric is fed along a central line extending longitudinally through the fabric across the horizontal platen plate beneath the needle mechanism, the bar being also laterally adjustable and the slots being laterally adjustable for modifying or correcting the central feed line beneath the needle mechanism, the adjusting means including an adjustable nut having female threads matedly mounted on a threaded male projection extending through the biasing spring for controlling biasing pressure against the stretcher arm and additionally the regulating means including an extendable shaft means for shortening or lengthening the leverage by axial movement of the shaft, and as a part of the control of automatically moving the fabric across the plate in the centralized position at a proper rate of movement together with reduced variations in movement of the needle shaft, there is included between a driving cam rotatably mounted on an off-set portion of a driving cam and at an opposite end the mechanism reciprocally driving the toothed feed dog for advancing the fabric beneath the needle, is an adjustable shaft axially adjustable by regulation of a nut around the adjustable shaft, and the variations in needle reciprocation and depth of penetration being reduced by an adjustable pivot axis and by the lever pivoted on that axis being connected at its terminal end to a drive shaft which is centrally flexible and which at the terminal end connected with the pivoted lever mounted in a ball socket for free multi-directional movement and the other end of the flexible drive shaft being mounted for reciprocal axial movement on ball bearings around an off-set portion of a main rotatable drive shaft, undesirable variations in the reciprocating movement of finger and spreader hooks being reduced by replacing the meshing gears between a primary drive shaft and a secondary drive shaft with a belt having along its inner surface a plurality of treads meshable with corresponding teeth on each of the opposing toothed wheels on the respective shafts.

3,745,950

PORTABLE ELECTRIC SEWING MACHINE

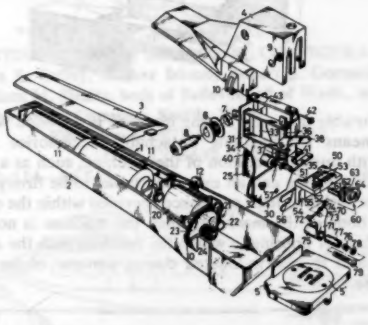
Tamotsu Kato, 856 Ooto, Yono-shi, Saitama-ken, Yono, Japan

Filed Mar. 15, 1972, Ser. No. 234,920

Claims priority, application Japan, Oct. 21, 1971, 46/97342; Oct. 29, 1971, 46/100602

Int. Cl. D05b *1/00*

U.S. Cl. 112—169 **3 Claims**



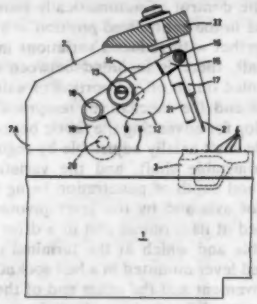
A portable electric sewing machine is provided which comprises an elongated casing containing therein an electric motor and its driving power source. The rotary power of the motor is converted through a sewing needle operating mechanism to up-down reciprocal movement of a sewing needle and is transmitted through a cam assembly to a toothed member and a swing member to move them in snychronization with the needle operating mechanism.

3,745,951

NEEDLE DRIVING DEVICE FOR SEWING MACHINES

Nerino Marforio, Milan, Italy, assignor to S.p.A. Virginio Rimoldi & C., Milan, Italy

Filed Dec. 30, 1971, Ser. No. 214,085
Int. Cl. D05b 55/14
U.S. Cl. 112—221 3 Claims



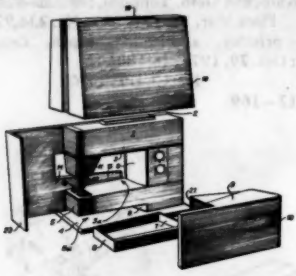
This invention relates to an improved sewing machine needle operating mechanism in which a pivoting lever is included that is mounted on the frame of the machine for pivoted movement about a fulcrum located below the needle driving lever. The pivoting lever is mounted in an attitude that is practically parallel with the path of travel of the needle and the needle carrier.

3,745,952

PORTABLE SEWING MACHINE WITH ACCESSORIES

Hannes Giesselmann, Huskvarna, Sweden, assignor to Husqvarna Vapenfabriks Aktiebolag, Huskvarna, Sweden

Filed Dec. 16, 1970, Ser. No. 99,216
Int. Cl. D05b 75/100
U.S. Cl. 112—258 5 Claims



A portable domestic sewing machine is provided with support means for enabling detachable accessories for use therewith during operation of the machine, such as a current regulating device and an extension table, to be firmly held in position within at least one space provided within the confines of the body of the machine, when the machine is not in use and a case or housing in which the machine with the accessories stored therein is located during non-use of the sewing machine.

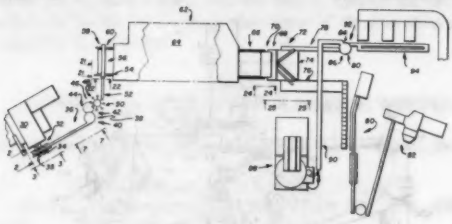
3,745,953

APPARATUS FOR PRODUCING CLOSURES

Robert L. Hurst, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Division of Ser. No. 784,845, Dec. 18, 1968, Pat. No. 3,641,959. This application Dec. 18, 1970, Ser. No. 99,444
Int. Cl. B21d 51/46
U.S. Cl. 113—1 D 15 Claims

Completely automatic system stamps and forms metal discs for closures of the two-piece type and feeds them sealing face down to a conveyor belt. At first transfer zone, magnet pulls each disc or lid up against lower pass of second conveyor belt. Magnetic pulley retains lids in contact with belt to swing up through arc to upper pass of belt. Lids are then conveyed to treating zone where gasket material is applied as lids are rotated and transported arcuately. Radial arms on carousel travel in circle to pick up lids sequentially by magnetism or vacuum from coating table and transfer them to upper pass of next conveyor. At next transfer zone, lids are picked up sequentially by individual magnets on lower pass of next con-



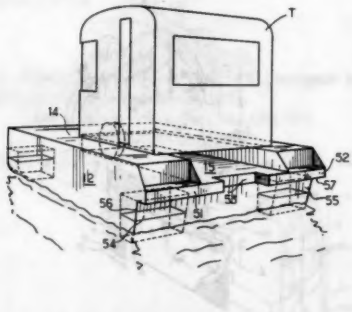
veyor and moved to next transfer zone where they are released in groups to form transverse rows on wide conveyor belt. Belt passes through curing station and diverter realigns transverse rows to fore and aft single file. Next conveyor transfers and feeds lids sequentially to assembly zone. Closure bands are also fed sequentially to assembly zone and combined with lids to produce assembled two-piece closures. Lids may alternatively be fed to different assembly zone where they are packed in sets for shipping. One-piece closures with integral lid and flange may be formed and processed in same manner.

3,745,954

BARGE FOR FERRYING A TRAILER

Jean Marie Augustin Jacques Louet, 19 rue Charles Chenu, 92 Puteaux, France

Filed Apr. 21, 1971, Ser. No. 136,148
Claims priority, application France, Apr. 23, 1970, 7014808; Apr. 14, 1971, 7113146
Int. Cl. B63b 35/00
U.S. Cl. 114—.5 5 Claims



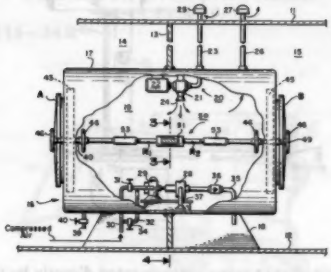
The deck of a barge has a rearwardly open depression of rectangular shape which forms a berth for a house trailer to be transported over a body of water. The rear of the barge has a pair of symmetrically positioned aprons, flush with the bottom of the depression, which overhang a wharf during docking and come to rest on a rabbeted portion of the wharf upon a shift in weight so as to form ramps for the wheels of the trailer entering or leaving the barge. The shift in weight is brought about by cross-connected water ballasts at the four corners of the barge.

3,745,955

TANK VESSEL AIR LOCK

Walter B. Devine, Houston, Tex., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed Oct. 4, 1971, Ser. No. 186,121
Int. Cl. B63g 8/24; B63b 35/00
U.S. Cl. 114—0.5 R 10 Claims



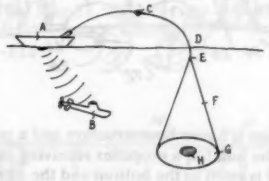
An air lock on a tank ship is arranged in the bulkhead between the engine and pump rooms to provide access to and from the pump room, the air lock being provided with doors on each end. Each door is openable only when the other door is closed there being an interconnection between the doors which prevents one being opened while the other is open, respectively and both doors being openable sequentially from within the air lock which forms a ventilated chamber.

3,745,956

SELF-GUIDANCE METHODS AND DEVICES FOR ANTI-SUBMARINE MISSILES

Jean Bertheas, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 11, 1971, Ser. No. 142,310
Claims priority, application France, May 29, 1970, 7019737; Oct. 13, 1970, 7036928
Int. Cl. F42b 21/20, 19/00
U.S. Cl. 114—23 31 Claims



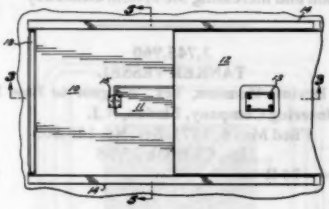
An anti-submarine self-guided missile having no self-propulsion system. Guidance is effected by controlling the position of vanes through the use of proportional navigation techniques and a passive listening post. Command signals proportional to the components of the angular rate of rotation of the missile defined at each instant by the position of the missile and of the target and measured relative to an absolute axis are applied to the control elements for controlling the position of the vanes.

3,745,957

SLIDING HATCH COVER FOR SAILBOATS

Arthur M. Hendrickson, 4607 Orrington Drive, Corona Del Mar, and William I. B. Crealock, 657 West 19th St., Costa, both of Calif.

Filed May 6, 1971, Ser. No. 140,911
Int. Cl. B63b 19/18
U.S. Cl. 114—202 7 Claims



The disclosure is directed to a sliding hatch cover for a sailboat having a slot covered by small subhatch to permit the hatch cover to slide partially past the mast.

3,745,958

CONTROL OF TOWED BARGES

Arthur John Nelson, 3304 Shasta Drive, San Mateo, Calif.

Filed Mar. 27, 1972, Ser. No. 238,097
Int. Cl. B63b 21/00
U.S. Cl. 114—236 14 Claims

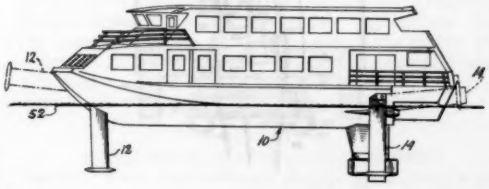
Connected vessels arranged to be towed in the course of a tugboat are dependent upon corrective steering by rudders activated by draft forces transmitted to a pivotal beam on the barge from a pair of hawsers paid-off from the tugboat with an adjusted difference in length to rotate the beam correspondingly. Draft forces and condition responsive steering are serially transmitted to successive barges in tandem tow with surge suppressors incorporated into the interconnections.

3,745,959

CONTINUOUS FLOW HYDROFOIL CONFIGURATION

Charles S. Coffey, Mercer Island; Robert J. Gornstein, and William M. Shultz, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

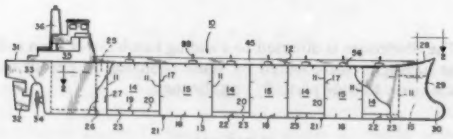
Filed Dec. 3, 1971, Ser. No. 204,642
Int. Cl. B63b 1/18
U.S. Cl. 114—66.5 H 8 Claims



A hydrofoil support arrangement for a hydrofoil boat incorporating a water jet propulsion ducting mechanism for foilborne and hullborne operations. The arrangement employs a hydrofoil strut assembly which is pivotally mounted to the boat for pivoting the assembly to a foil-submerged or foil-

emerged position. The foil strut assembly utilizes a center strut or column which has a first inlet and internal duct for feeding water to the propulsion means during foil-submerged conditions. A second hull inlet in the duct is provided which opens upon foil-strut retraction, thus replacing the first inlet so that continuous water input at the foilborne and hull-borne operations is maintained. The foil strut overall assembly adds to structural strength, and the outer struts act as efficient end plates to the lifting foil surfaces thereby reducing the tip vortex formation and increasing the system efficiency.

3,745,960
TANKER VESSEL
Walter B. Devine, Houston, Tex., assignor to Esso Research and Engineering Company, Linden, N.J.
Filed May 6, 1971, Ser. No. 140,803
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 R **6 Claims**

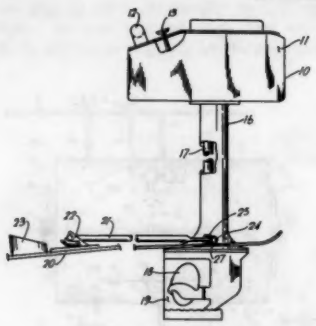


A tanker vessel for carrying liquid material is provided with a cargo area provided with a plurality of spaced apart longitudinal bulkheads and a plurality of parallel transverse bulkheads vertically extending from the main deck of the vessel to the vessel shell, said bulkheads forming a plurality of wing tanks, first central tanks, selected of the first central tanks having a double bottom, divided by a vertical bulkhead into two tanks. The double bottom carries liquid water ballast only, the first selected central tanks carry water ballast or other liquid products, and the remaining tanks carry liquid products. The first selected central tanks are free of bulkhead stiffeners which are provided on the longitudinal and transverse bulkheads.

3,745,961
POWERED APPARATUS FOR WATER TRAVEL: SEA SADDLE
Glenn D. Laughman, Spring Grove, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest
Filed Jan. 6, 1972, Ser. No. 215,825
Int. Cl. A63b *31/00*
U.S. Cl. 115—6.1 **1 Claim**

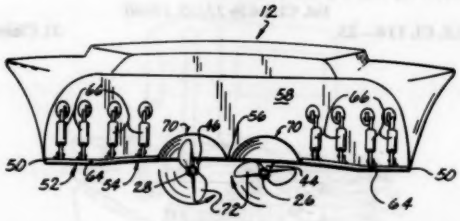
Powered apparatus for water travel comprising a chest plate, a direct current motor having a propeller on its drive shaft and mounted on the plate, a direct current power source, a switch connected in circuit via a cable with said source and motor and means supporting said source and detachably securing said plate to the chest of a wearer.

3,745,962
MOTORIZED SKI TOWING UNIT
John V. Murphy, Six Dawes Place, Larchmont, Ind.
Filed Jan. 31, 1972, Ser. No. 222,034
Int. Cl. A63c *11/10*
U.S. Cl. 115—6.1 **3 Claims**



A motorized ski towing unit operated directly by the water-skier to enable a water-skier to be self-propelled. The apparatus consists of an outboard type motor mounted in a flotation unit, with means to fasten the motor unit by tow bars to a pair of water skis. The attachment of the towing bars to the skis is of an automatic release type, so as to free the skis and skier from the tractor unit, in the event of a spill. Spring loaded valves controlled by the skier close the air intake to the carburetor and the exhaust manifold outlet so as to shut the motor off automatically in the event of a spill, and to prevent water from entering into the engine compartment when the motor becomes disconnected from the skier. Propelling means may consist of a conventional propeller, suitably shrouded, or a jet stream of water powered by a fully enclosed impeller blade.

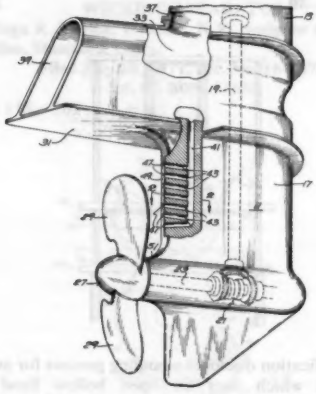
3,745,963
BOAT STRUCTURE
Wesley H. Fisher, 126 Mathewson, Wichita, Kans.
Filed Aug. 14, 1970, Ser. No. 63,723
Int. Cl. B63b *1/38*
U.S. Cl. 115—34 R **5 Claims**



The invention is a new boat structure and a method of boat propulsion. The hull has a propeller receiving cavity in the aft portion which is open to the bottom and the stern of the boat. It is of size and construction to receive only a portion of the propeller, and in operation the cavity is substantially out of the water. The boat has a power source to drive the propeller, and steering apparatus mounted in the hull to steer the boat. The new method of the invention provides a means of propulsion for a boat hull wherein in operation the driving propeller blade is in the water only approximately one half the time, and the cavity provided in the bottom of the stern of the boat hull out of the water receives the blade of the propeller during its travel out of the water. The preferred specific embodiment of the new method utilizes two such propellers in operation,

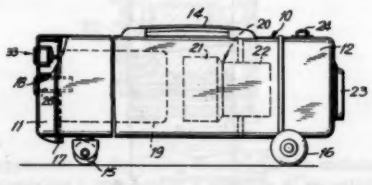
turning on axis longitudinal to the longitudinal axis of the boat hull, substantially parallel and spaced on either side of the boat hull longitudinal axis, with the propellers rotating in opposite direction. A central cushion of air beneath the boat hull is provided in operation.

3,745,964
RACING LOWER UNIT
Donald A. Henrich, Lake Cilla, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Aug. 19, 1971, Ser. No. 173,065
Int. Cl. B63h 19/06
U.S. Cl. 115—34 R 10 Claims



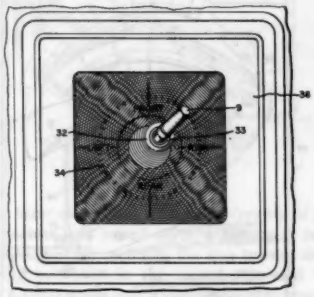
Disclosed herein is a marine propulsion device comprising a lower unit including exhaust gas discharge means located in the lower unit for discharging gas, during forward travel, into the area in front of the upper half of the path of the blades of a propeller rotatably carried by the lower unit.

3,745,965
VACUUM CLEANER HAVING SIGNAL FOR INDICATING ABSENCE OF DUST BAG
Hans Georg Ljung, Jakobsberg; Dan Johannes Barrner, Vallingby, and Karl Gustav Grellsson, Sollentuna, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed May 31, 1972, Ser. No. 258,377
Int. Cl. G08b 21/00
U.S. Cl. 116—112 8 Claims



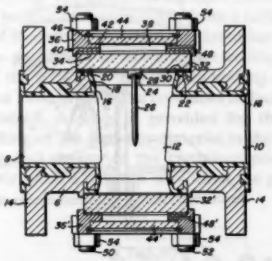
In a vacuum cleaner, a device for producing an audible signal when operation of the cleaner is initiated and no dust bag is positioned in the cleaner.

3,745,966
FOUR-QUADRANT INDICATOR EMPLOYING MOIRE EFFECT
Richard H. Seager, Manlius, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Nov. 26, 1971, Ser. No. 202,369
Int. Cl. G09f 9/00
U.S. Cl. 116—124 11 Claims



Display apparatus for indicating motion and displacement of a control lever movable about one end thereof through various positions within a spherical sector of radius substantially coextensive with the lever comprises a first regular pattern formed on a transparent surface positionable by the control lever, and a second regular pattern formed on a surface beneath the positionable surface. By employing equally spaced lines in each pattern, each position of the control lever results in creation of unique moire fringes which are set into motion whenever the control lever is moved.

3,745,967
FLOW INDICATOR
Russel G. Smith, Cincinnati, and Nikolai Belaef, Fairfield, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio
Filed Dec. 23, 1971, Ser. No. 211,532
Int. Cl. G01f 15/00
U.S. Cl. 116—117 R 10 Claims



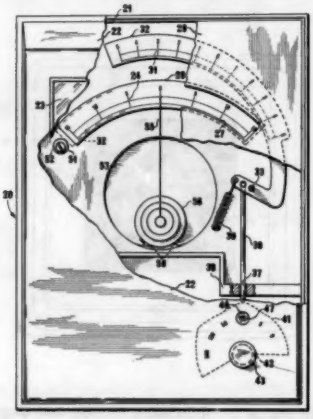
The flow indicator comprises a conventional rotary plug valve body adapted easily for alternative use as a flow indicator housing, and includes simple and inexpensive constituents which lend themselves to assembly in a rapid labor-saving manner to produce an accurate, effective, safe and inexpensive visual flow indicator which is easily readable.

3,745,968

DEVICE FOR CHANGING THE SCALE OF A MEASURING INSTRUMENT

Mario Possati, Bologna, Italy, assignor to Apparecchi Elettronici Marposs, Bologna, Italy

Filed Oct. 5, 1971, Ser. No. 186,696
Claims priority, application Italy, Oct. 16, 1970, 3587 A/70
Int. Cl. G09f 9/00
U.S. Cl. 116—129 R **3 Claims**



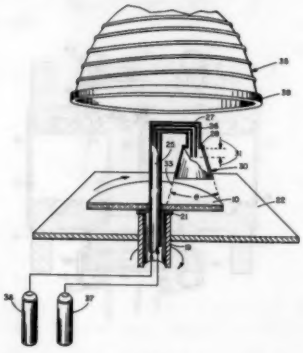
A scale-changing device wherein a fixed sector bears a first scale and at least one movable second sector bears a second scale, and means are provided to displace said movable sector from a position of rest to an operating position wherein it is superimposed over said fixed sector, so that only one of said scales is selectively visible.

3,745,969

OFFSET TOP EJECTION VAPOR DEPOSITION APPARATUS

Ralph Richard Huffman, Mesa, and Siegfred Alexander Smith, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 19, 1971, Ser. No. 135,305
Int. Cl. C23c 13/12
U.S. Cl. 118—48 **2 Claims**



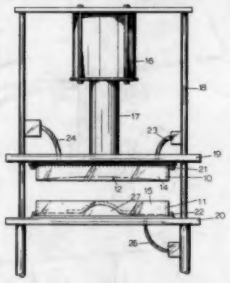
There is disclosed offset top ejection apparatus for use in vapor deposition chambers which provides a uniform contamination-free layer on top of a spinning susceptor plate. The uniformity of the layer is assured by providing an offset downwardly pointing nozzle which is off-centered from the revolving susceptor and from which the deposited material emanates. The arrangement of apertures and the taper of the conical nozzle defines the extent and uniformity of the resulting layer in the offset configuration. Off-setting an ejection nozzle permits a larger area to be uniformly coated resulting in a higher yield for semiconductor wafers carried by the rotating susceptor plate and on which are deposited a layer of dielectric, passivation or other material.

3,745,970

APPARATUS FOR APPLYING A PATTERN TO AN ARTICLE

Clifford V. Scantlebury, Erie, Pa., assignor to Erie Universal Products Company, Erie, Pa.

Filed Jan. 7, 1971, Ser. No. 104,706
Int. Cl. B05c 1/02
U.S. Cl. 118—50 **2 Claims**



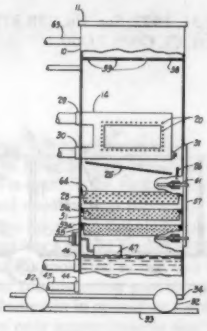
This specification discloses a coating process for articles of manufacture which uses an open hollow head and a diaphragm stretched across the opening. The diaphragm has embossed on it the pattern which is to be coated on the article. Air pressure forces the diaphragm into engagement with a coating plate. The diaphragm is then drawn up into the head. The coating plate is removed and replaced by the article to be coated. Air pressure forces the diaphragm into engagement with the article thereby coating the pattern on the article.

3,745,971

VACUUM COATING APPARATUS

Laurence A. Story, Burnaby, Canada, assignor to SCM (Canada) Ltd., Toronto, Ontario, Canada

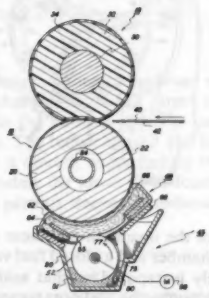
Filed Apr. 14, 1971, Ser. No. 133,810
Int. Cl. B05c 5/00, 11/04, 11/16
U.S. Cl. 118—50 **5 Claims**



Disclosed is a method and apparatus for coating, impregnating or otherwise surface treating boards, strips, sheets, planks

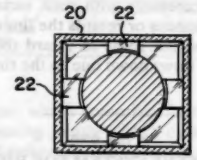
and similarly shaped elongated workpieces suitably of lumber, but also of metal, boxboard and so on. A series of workpieces are fed into a coating chamber maintained at subambient pressure through openings lined with flexible wipers which define apertures generally n conformity with cross-sectional periphery of the workpiece being coated. One or more of the surfaces of the workpiece are flushed with a liquid coating composition within the chamber by flowing an excess of what remains on the workpiece, the excess coating draining by gravity to a reservoir for recycle. Upon leaving the chamber, the flexible wiper on the outlet aperture acts as a squeegee to assist in sealing the outlet while the workpiece is passing through and to wipe the coating free of air bubbles and solid contaminants.

3,745,972
WICKING APPARATUS
Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 20, 1971, Ser. No. 164,370
Int. Cl. B05c *11/00*
U.S. Cl. 118—261 **4 Claims**



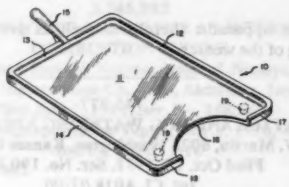
Apparatus for lubricating the heated fuser roll in a heated pressure xerographic fusing system. The apparatus includes an applicator roll for providing a film of oil to a wick assembly having a Teflon layer contacting the fuser roll and a Nomex layer contacting the applicator roll where the Nomex layer is flame treated to provide high oil retention and prevent binding the drive of the applicator roll.

3,745,973
APPARATUS FOR DISPERSING LIQUIDS OVER THE SURFACES OF OBJECTS
Franklin J. Knecht, 3 Dogwood Court, Mahwah, N.J.
Filed July 31, 1972, Ser. No. 276,478
Int. Cl. B05c *11/14*
U.S. Cl. 118—400 **10 Claims**



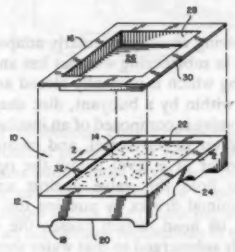
An apparatus for dispersing liquids over the surfaces of objects comprises a tray having a plurality of receptacles provided therein for receiving the liquid, and handles at the ends thereof for rotating the tray. A plurality of covers are disposed over each of the receptacles to form a liquid-tight container for treating the objects. Articles are supported, spaced from the container walls by a small plurality of widely spaced rib elements having free edges of minimal cross-section which extend from the inner surface of each cover and associated receptacle.

3,745,974
PET TRAINING TRAY
Margaret K. Karasz, 164 Colonial Avenue, Albany, N.Y.
Filed Dec. 17, 1971, Ser. No. 209,210
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 **2 Claims**



A simple litter or training station preferably of plastic having a flat bottom and raised sides, a handle at one end and means at the other for inclining the tray toward the handle, a cutout being provided in the raised side and bottom for removal of animal waste into a standard toilet receptacle.

3,745,975
DISPOSABLE PET RELIEF STRUCTURE
Stephen J. Prucha, 1546 Millard, Madison Heights, Mich.
Filed Sept. 21, 1971, Ser. No. 182,359
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 **3 Claims**

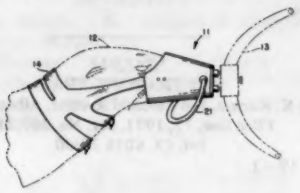


A throwaway litter box for cats or the like comprising a generally rectangular container partly filled with absorbent granular material. The container includes thereon supports for spacing the bottom of the container from a surface on which it is positioned to prevent moisture condensation on the surface beneath the container, an inwardly extending flange at the open top of the container to minimize spilling of the granular material, and hand grips in the container to facilitate handling of the container. A cover is provided for the container to prevent shifting of the granular material in the container during shipping and storing of the container prior to use. The cover also serves as a pet dish tray when the pet relief structure is in use.

3,745,976
RESILIENT MARINE MAMMAL NOSE CUP
Ronald L. Seiple, Kailua, Hawaii, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 30, 1971, Ser. No. 214,227
Int. Cl. A01k *29/00*
U.S. Cl. 119—129 **5 Claims**

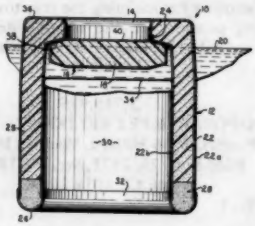
A tool holder of general applicability has a molded rubber construction to frictionally engage the nose of the user.

Spaced apertures in the tool holder permit attachment of tools



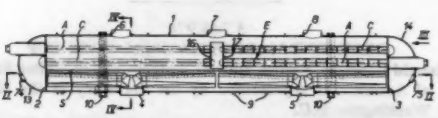
and other apparatus thereto as well as permitting normal breathing of the wearer.

3,745,977
CATTLE AND HOG WATERING APPARATUS
Mervin W. Martin, 8028 Washington, Kansas City, Mo.
Filed Oct. 18, 1971, Ser. No. 190,149
Int. Cl. A01k *07/00*
U.S. Cl. 119—73 **8 Claims**



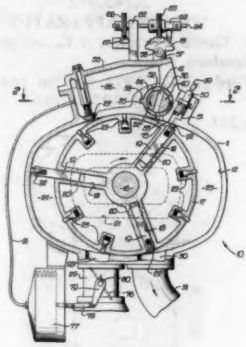
A water-receiving vessel particularly adapted for the watering of livestock in subfreezing weather has an upwardly facing drinking opening which is normally closed and sealed against heat loss from within by a buoyant, disc shaped valve within the vessel. The valve is composed of an insulating material and floats on the water in the vessel, and means is provided to maintain the water at a level below the opening but sufficiently high to hold the valve against an overlying seat therefor. The animal drinks by pushing the valve down into the water with its head, which causes the valve to tip and become partially submerged so that water then covers the submerged part and may be drunk. When the valve is released and rises to reclose, the water drains back into the vessel to thereby prevent the valve from freezing in the closed position.

3,745,978
APPARATUS FOR DRYING AND SUPERHEATING STEAM
Marc Armand, Saint-Germain-en-Laye, France, assignor to Babcock-Atlantique, Paris, France
Filed Nov. 30, 1971, Ser. No. 203,311
Claims priority, application France, Dec. 2, 1970, 7043292
Int. Cl. F22g *5/16*
U.S. Cl. 122—483 **21 Claims**



An apparatus for drying and heating steam, comprising a horizontally elongated casing, provided with inlet and outlet means for circulating the steam therein from bottom to top along a path successively passing through a moisture extractor, and a surface exchanger forming a superheater, and provided with outlet apertures for these exchanger elements, characterised in that the superheater is composed of a plurality of independent banks of tubes which are elongated in the longitudinal direction of the shell and in cross-section occupy less space in height than in width.

3,745,979
ROTARY COMBUSTION ENGINE
Robert H. Williams, Rt. 2, Bandera, Tex.
Filed Sept. 27, 1971, Ser. No. 184,110
Int. Cl. F02b *53/06*
U.S. Cl. 123—8.15 **6 Claims**

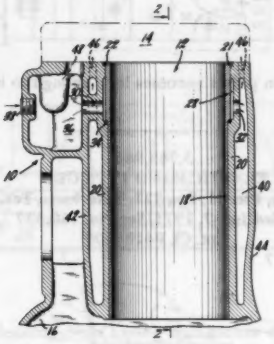


The engine of the invention embraces a stator providing a closed piston chamber and a closed fuel valve bore on parallel axes and closely juxtaposed so that said valve bore is connected to said chamber by fuel port means formed in said stator. A rotary piston means is rotatably mounted in cyclic sliding relation with said stator chamber to cyclically produce an expanding subchamber adjacent to said valve bore and communicating therewith through said fuel ports. A rotary sleeve valve means rotatably journals in a pair of opposed sleeve sectors occupying said valve bore and held in spaced relation with each other by said valve means, the latter having a diametral slot through which gaseous fuel vapor is fed between juxtaposed lower edges of said sleeve sectors and through said fuel ports into said subchamber. One of said sleeve sectors is fixed in said bore while the other is rotatable to have the effect of a throttle by decreasing or increasing the spacing between lower juxtaposed edges of said sleeve sectors. The engine includes means for rotating the sleeve valve in a fixed timed relation with the rotary piston means but the amount of fuel fed through said sleeve valve is controlled by a pedal actuated throttle for rocking the rockable sleeve sector to vary the spacing of the lower edge of this from the lower edge of the fixed sector. Simultaneously with such variation, said pedal correspondingly advances or retards the timing of the ignition distributor of the engine so as to retard the ignition as the speed of the engine slows down due to the throttle being relatively closed.

3,745,980
CYLINDER SLEEVE SYSTEM FOR HIGH OUTPUT ENGINE
Frank J. Pekar, Jr., and Eugene Eisenberg, both of Hagerstown, Md., assignors to Mack Trucks, Inc., Allentown, Pa.
Filed May 28, 1971, Ser. No. 147,812
Int. Cl. F02b *75/18*
U.S. Cl. 123—41.74 **15 Claims**

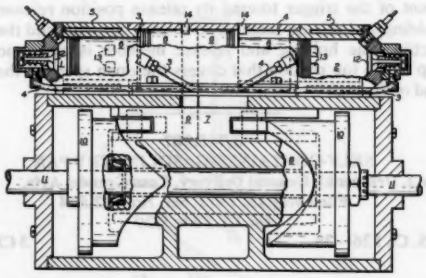
A cylinder sleeve system for the cylinder block of a high output internal combustion engine includes a circumferential recess in the upper region of each cylinder bore wall that

forms with a cylinder sleeve fitted in the bore an annular coolant chamber surrounding the upper region of the sleeve. The chamber has a shallow radial depth, preferably of constant cross section, so as to cause high, generally uniform velocity coolant flow through the chamber, thereby promoting rapid cooling of the upper region. Coolant discharged from the chamber flows to a coolant jacket surrounding the lower region of the cylinder sleeve, where it circulates at reduced



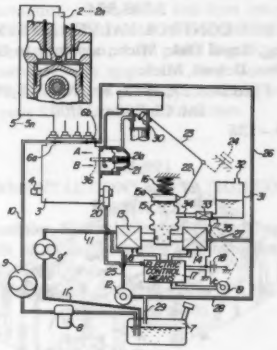
velocity to effect slower cooling of the lower region. The coolant in the upper chamber is thus in direct contact with the sleeve while that in the coolant jacket is contained against such direct contact. The recess is sized and located such that the cylinder sleeve is directly supported by the cylinder bore wall over approximately the lower three-fourths of its length. This configuration permits sleeves of reduced wall thickness to be used.

3,745,981
INTERNAL COMBUSTION ROTOR ENGINE
Henry Warner, 164-71 Underhill Avenue, Flushing, N.Y.
Filed Sept. 2, 1970, Ser. No. 68,857
Int. Cl. F02b *75/26*
U.S. Cl. 123—58 AB **2 Claims**



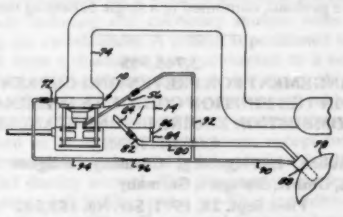
A rotor engine, which comprises fourfold working pistons. The pistons forming jointly with a cylinder two ring-shaped compression chambers in the center section of the cylinder. The cylinder defines in one of its sections two combustion chambers. The pistons, being on a power stroke every time, the piston moves one side of the cylinder to the other side. The cylinder has a cylinder head including ports to pilot the intake to an exhaust from the engine by the pistons, compression pipes are also provided and passage means are arranged for a fuel-air mixture from the compression chamber through compression pipes to the top of valves in the cylinder heads. A rotor assembly comprises a left rotor and a right rotor. The rotors have cam-like tracks. At least one cylindrical runner assembly including at least one runner and are placed between the cam-like tracks of the rotors. The rotors include two cylindrical castings on a rotor shaft, such that they are facing each other, yet 90° off set from each other, so that a high lobe of one of the rotors is opposite a low lobe of the other of the rotors, and being in constant contact with the cam-like tracks. A roller pin connects the runners and transmits the power stroke of the engine from the pistons to the runner, and the number of power strokes are available through the use of one cylinder and piston-assembly dependent upon the number of the lobes.

3,745,982
FUEL CONTROL MEANS FOR AN INTERNAL COMBUSTION ENGINE
Toshi Suda, and Senichi Nagata, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan
Filed July 1, 1971, Ser. No. 158,962
Claims priority, application Japan, July 1, 1970, 45/57970
Int. Cl. F02d *11/10*
U.S. Cl. 123—102 **1 Claim**



In an internal combustion engine including a centrifugal or fluid type mechanical governor for normal engine operation, fuel control means additionally comprises, for constant speed operation, electrical control means for comparing the actual and reference engine speeds and producing an output which is used to control an accelerator mechanism of the engine.

3,745,983
CARBURETOR APPARATUS AND METHOD
Maxwell Patrick Sweeney, Los Angeles, Calif., assignor to Energy Transmission Corporation, San Bernardino, Calif.
Filed Nov. 27, 1970, Ser. No. 93,133
Int. Cl. F02m *9/06, 7/24, 7/10*
U.S. Cl. 123—119 R **30 Claims**



Apparatus and method for reducing pollutant emissions by improving fuel atomization and optimizing air-fuel ratio in the carburetion of internal combustion engines. A small stream of bleed air is mixed with the fuel after it has passed through the

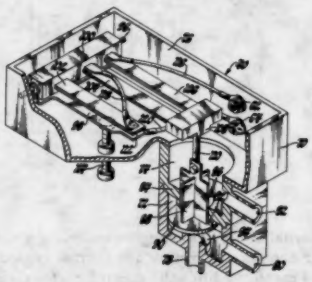
fuel metering restriction but before atomization thereof, and then this mixture of fuel and bleed air is passed through the atomizing orifice. The atomizing velocity is thereby increased, causing improved atomization and hence better combustion of the mixture, resulting in less pollutant emissions. By providing the bleed air from a source wherein the pressure is generally inversely related to the rate of fuel flow, a relatively large amount of bleed air is made available to thus improve combustion at low speed operating conditions when hydrocarbon emissions tend to be excessive, while accommodating greater fuel flow as required during high speed operating modes when atomization is normally good. Modulation of this bleed air flow provides an effective means for adjusting the air-fuel ratio output of the carburetor. Thus, in one form of the invention temperature-responsive bleed air modulation provides self-adjustment to compensate for the natural tendency of a carburetor to richen the mixture as its ambient temperature increases. In another form of the invention the air-fuel ratio is automatically adjusted to compensate for air-fuel ratio deviations from the desired average by sensing the air-fuel ratio and modulating the bleed air flow in response thereto.

3,745,984

PURGE CONTROL VALVE AND SYSTEM

Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1971, Ser. No. 211,991
Int. Cl. F02m *21/00*
U.S. Cl. 123—136 **4 Claims**



A purge control valve adapted to control the purge of fuel vapors from storage means into the engine induction system. The valve is preferably connected to the engine starting means and closes in response to an electric current during engine starting to prevent vapors entering the induction system immediately after starting, after which the system is gradually opened to permit normal purge flow. Application of the valve to an engine having crankcase fuel vapor storage is disclosed, although other applications are possible. The valve structure includes electrically heated bimetallic elements, a cutout mechanism to prevent overheating and means for adjusting the valve preload, combined in a single actuating mechanism.

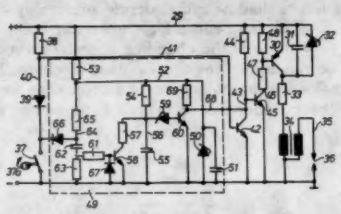
3,745,985

ARRANGEMENT FOR PREVENTING CURRENT FLOW IN THE IGNITION COIL OF AN INTERNAL COMBUSTION ENGINE DURING STANDSTILL CONDITIONS

Gerd Hohne, Ludwigsburg, Germany, assignor to Robert Bosch, GmbH, Stuttgart, Germany

Filed Sept. 24, 1971, Ser. No. 183,502
Claims priority, application Germany, Sept. 28, 1970, P 20 47 586.9
Int. Cl. F02p *3/02*
U.S. Cl. 123—146.5 D **13 Claims**

The transistor which, when blocked, interrupts the primary current in the ignition coil thereby causing a spark is also blocked by an additional control system when the interval



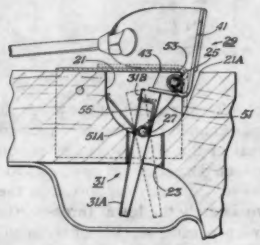
between ignition pulses becomes long enough to indicate engine standstill.

3,745,986

ELASTIC BAND TYPE GUN

Ray E. Crowson, Rte. 11, Box 522, Texarkana, Tex.

Filed July 7, 1971, Ser. No. 160,337
Int. Cl. F41b *7/00*
U.S. Cl. 124—17 **3 Claims**



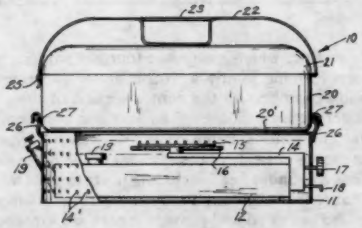
A sling shot gun having a stock and barrel and a housing. Pivotally supported by the housing is an L-shaped member including a holding and release member and a horizontal portion supported to extend from the housing and to pivot between holding and release positions for holding and releasing the end of a resilient sling and a projectile. A biasing member is provided for biasing the holding and release member to its holding position. A trigger is supported by the housing to pivot between holding and release positions. The trigger is normally biased against the L-shaped member for retaining the holding and release member in its holding position. Movement of the trigger toward its release position releases the holding and release member to release the sling and the projectile. The holding and release member is positioned on top of the top portion that covers the open space at the rear end of the gun.

3,745,987

SELF-CONTAINED GASOLINE FRY PAN

Joe J. Dribnenki, General Delivery, Casa Grande, Ariz.

Filed May 12, 1971, Ser. No. 142,504
Int. Cl. F24c *5/20*
U.S. Cl. 126—38 **3 Claims**



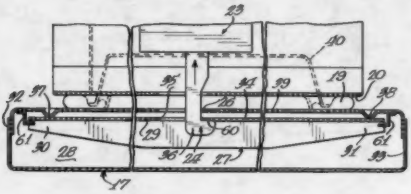
A portable frying pan. A base member with a gasoline fired burner, the base being clipped to the frying pan body which is removable.

3,745,988

SELF-CLEANING OVEN DOOR HOLDING MEANS

Harold L. Frick, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 5, 1971, Ser. No. 196,135
Int. Cl. F21b 1/00
U.S. Cl. 126—273 R 16 Claims



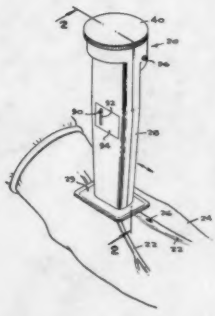
A self-cleaning oven having wall means defining an oven chamber defining a front opening, a door for closing the front opening, and means for producing a self-cleaning, high temperature condition within the oven chamber including a manually operable control member selectively settable to place the oven in a self-cleaning mode. Means are provided for equalizing the pressure applied to the door for holding the door in a chamber closing position during the self-cleaning operation.

3,745,989

DEVICE FOR LOCATING VEINS IN LIVING BODIES

Sanford Pinna, 500 68th Avenue South, St. Petersburg, Fla.

Filed Apr. 26, 1972, Ser. No. 247,781
Int. Cl. A61b 5/00
U.S. Cl. 128—2 R 10 Claims



A casing is provided with an elongated sensor rod and a marking rod mounted for axial reciprocation by a motor driven cam through compression springs so that the sensor is moved outwardly of the casing by a constant force with the end of the sensor engaging a living body so that the distance of outward movement depends on the resistance of the body, a latch release lug extends from the sensor to release a spring urged marking rod for outward movement to mark the surface of the body in response to movement of the sensor rod beyond a given position in response to lessened resistance to outward movement of the sensor occasioned by a vein positioned beneath the sensor.

3,745,990

HUMAN MOTOR COORDINATION MEASURING APPARATUS

Harry B. Neis, R.R. No. 1, Box 199A, Osage Beach, Mo.

Division of Ser. No. 832,548, May 21, 1969, Pat. No. 3,572,699. This application Oct. 26, 1970, Ser. No. 84,143
Int. Cl. A61b 5/00
U.S. Cl. 128—2 S 4 Claims

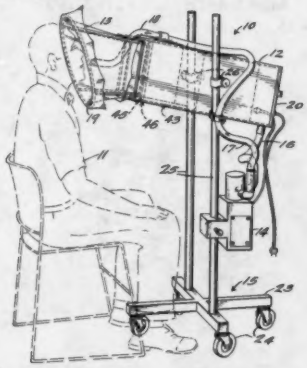
A stationary exercise device is modified to record cyclic positional information of the hand and foot operated pedals against a variable load which load level is also recorded to indicate brain damage in terms of pedal lag for either set of pedals. Alternatively, the apparatus may be motor driven under a specified load for a partially or totally incapacitated person for therapy for the motor brain center.

3,745,991

ENVIRONMENTAL CONTAMINATION CONTROL DEVICE

William D. Gauthier, Sylvania Township, and Jeter L. Ridley, Toledo, both of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Feb. 22, 1971, Ser. No. 117,391
Int. Cl. A61b 10/00
U.S. Cl. 128—2 R 13 Claims

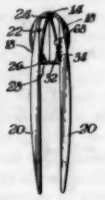


An improved device for a medical treatment station which may include inducing and collecting sputum without contaminating the environment. A patient is positioned to inhale an aerosol from a discharge hose connected to a nebulizer. Sputum, excess aerosol and room air are drawn through an ultra-high-efficiency filter system to remove preferably at least 99.97 percent of 0.3 micron and larger particles from the air. The purified air is returned to the room, except for a controlled portion which is diverted to the nebulizer for delivering a controlled density aerosol. The filter system preferably includes a gross particle filter and a pre-filter in addition to the ultra-high-efficiency filter. The aerosol discharge hose is positioned in a cowl which directs room air, exhaled air, sputum and excess aerosol to the filter. The highly contaminated aerosol discharge hose, cowl, gross particle filter and pre-filter, and in severe contamination cases the housing and the ultra-high-efficiency filter, are all disposable.

3,745,992
SPECULUM

Jean R. Poirier, Frederick, Md., assignor to Medspecs, Inc., Frederick, Md.

Continuation-in-part of Ser. No. 46,725, June 16, 1970, abandoned. This application Aug. 12, 1971, Ser. No. 171,187
Int. Cl. A61b *1/30, 1/32*
U.S. Cl. 128—17 **9 Claims**

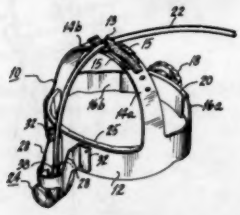


A speculum is formed of a stiffly flexible plastic material whereby two blade-like members are joined along one edge by a hinge which integrally connects the two blades together for pivotable movement. The hinge means permits the blades to be manipulated between open and closed positions. A locking member formed between the blades permits the opening angle between the blades to be adjusted as desired. The blade-like members, when in a closed position, appear generally triangular in cross-section with the hinge means forming one of the vertices of the triangle. Additional design configurations facilitate the speculum's usage.

3,745,993
SURGICAL HEADLIGHT

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., New York, N.Y.

Filed May 2, 1972, Ser. No. 249,524
Int. Cl. A61b *1/06;* F21v *21/00*
U.S. Cl. 128—23 **7 Claims**

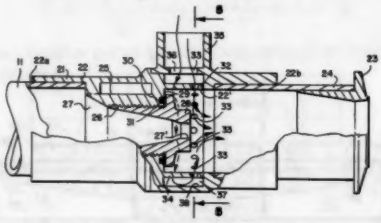


A surgical headlight adapted to be worn on the head of a user including a novel bracket construction attached to the headband for pivotally and frictionally supporting a light projecting focussing element such that the coaxial design coincides with the visual axis of the eye. The bracket includes a pair of spaced-apart substantially parallel flat metal bands of steel which are slightly spread further apart at one end than at the other end for supporting the focussing element which is force-fit between the lower ends of the arms. The bottom portions of the arms exert an inward pressure against the housing of the focussing element. The focussing element is highly compact and includes a 45° angle mirror arranged at one end of an opaque housing, an achromatic lens at the other end of the housing having an axis the extension of which falls on the center of the mirror, and a fiber optic light carrying cable for projecting a beam of light from the top of the housing onto the center of the mirror for bending the light beam 90° to strike the concave surface of the achromatic lens.

3,745,994
ADJUSTABLE HYDROTHERAPY JET PRODUCING DEVICE

Robert J. Kane, 5035 North 12th St., Phoenix, Ariz.

Filed Nov. 15, 1971, Ser. No. 198,905
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **6 Claims**

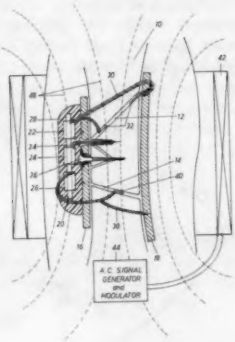


A pool mountable hydrotherapy jet producing device which embodies an adjustable dial for air and water mixing providing full control of a plurality of jets of water from an off condition through a range of from gentle to forceful stimulating hydromassage jet effects.

3,745,995
APPARATUS AND METHOD FOR AIDING FORMATION OF BONE FORMING MATERIAL

Werner Kraus, Bauerstrasse 31, D-8 Munich 13, Germany

Filed Apr. 9, 1970, Ser. No. 26,809
Claims priority, application Germany, Apr. 10, 1969, P 19 18 299.1
Int. Cl. A61n
U.S. Cl. 128—82.1 **20 Claims**



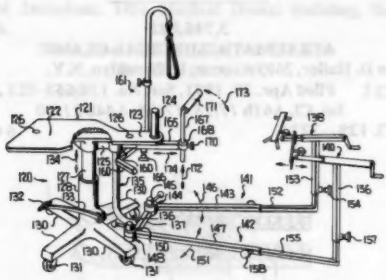
An apparatus and method for aiding formation of bone forming material in the region of a bone structure of a living being, especially a human being, has at least one pick-up coil having first and second terminals, each of which being d.c.-coupled to at least one electrode, each pair of electrodes connected to a respective at least one electrode. Each pair of electrodes straddles a region of the bone structure within which enhanced formation of bone structure, specifically callus, is desired. Field generating means is provided for inducing in the pick-up coil an a.c. current having gentle, gradual slopes, a frequency preferably below 100 c/s, and a magnitude which produces a current density of no more than 10 microamperes per square millimeter at the electrodes.

3,745,996

APPARATUS FOR THE REDUCTION OF BONE FRACTURES

Leslie V. Rush, Sr., Meridian, Miss., assignor to The Berivon Company, Meridian, Miss.

Filed Feb. 19, 1971, Ser. No. 116,821
Int. Cl. A61f 5/04
U.S. Cl. 128—84 B **20 Claims**



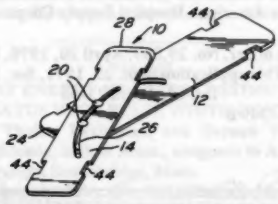
This disclosure relates to apparatus for the reduction of bone fratures and the surgical fixation by intramedullary pins using X-ray guidance, and particularly C arm X-ray machines, and includes a movable frame having a vertically adjustable radiolucent table top with a cantilevered hip-supporting portion and a pair of traction pieces cantilevered by adjustable bars pivoted at one end to the frame thereby providing a relatively unobstructive operative area into which may be interposed the C arm of the X-ray machine between the respective extremity of the patient and the frame of the apparatus with an adjustable well leg support and an adjustable knee counter support being appropriately positioned (or removed) as desired for particular fracture treatment.

3,745,997

SPLINT ASSEMBLY

Walter O. Gledhill, 512 Norwood Avenue, Warminster, Pa.

Filed May 28, 1971, Ser. No. 148,091
Int. Cl. A61f 5/04
U.S. Cl. 128—88 **6 Claims**



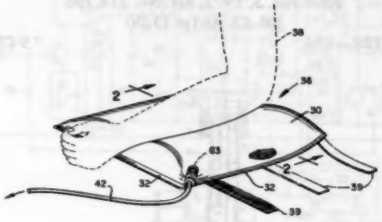
A splint assembly for emergency treatment of patient fractures. The splint assembly includes two planar, rectangularly shaped members constructed of a suitable structurally rigid material. The planar members include respective arcuate through slots of identical dimensions. In operation, the members are placed in an overlapping position to receive a pair of carriage bolts passing through the arcuate slots. The members may be angularly oriented with respect to each other and locked in place by tightening the bolts. Recesses are also provided on opposing sides of the planar members to permit securement of straps or bandages. Additionally, the splint assembly may be provided to the user in a kit which includes a multiplicity of different sized planar members for use in a wide range of size configurations.

3,745,998

VACUUM FORMED SUPPORT STRUCTURES AND IMMOBILIZER DEVICES

Frank L. Rose, New Fairfield, Conn., assignor to Bio-Medical Systems, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 817,486, April 18, 1969, abandoned. This application Jan. 6, 1971, Ser. No. 104,410
Int. Cl. A61f 5/04
U.S. Cl. 128—89 R **13 Claims**



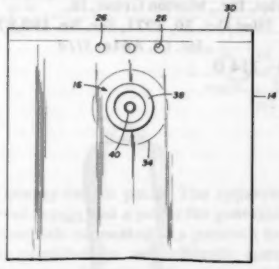
Rigidifiable and collapsible support structures are utilized as orthopedic casts and slings, litters, and stretchers, cervical collars and related devices, with two conditions or modes of operation, a collapsed condition in which they are easily molded and formed to conform to the contours of the human body or other object to be supported or enclosed, and a rigidified condition in which they are stiffly and rigidly maintained in their molded shape over long periods of time to provide the desired supporting function. Large numbers of extremely lightweight foamed or hollow bodies of polymer material, are enclosed in flexible sealed enclosures formed of resilient stretchable plastic film, capable of being evacuated to low internal pressures relative to the surrounding atmospheric pressure, and foraminous distributor units serve to retain the lightweight polymer filler particles within the enclosure while permitting the withdrawal of gas therefrom to evacuate the enclosure, permitting atmospheric pressure to compress the entire unit and retain it rigidly in the molded position desired.

3,745,999

MEDICAL SUCTION METHOD AND APPARATUS

David W. Deaton, Dallas, Tex., assignor to Deaton Medical Company, Dallas, Tex.

Filed Dec. 8, 1971, Ser. No. 206,018
Int. Cl. A61m 1/00
U.S. Cl. 128—277 **10 Claims**



The specification discloses a medical suction technique including a generally rigid container which supports a flexible drainage bag therein. A pair of conduits extend from the container for connection to a patient area to be drained and for connection to a source of reduced pressure. In operation, fluid is drawn from the area to be drained and collected within the drainage bag. A plurality of apertures are formed through the side walls of the bag in order that the pressure is equalized on both sides of the bag to prevent the bag from becoming closed

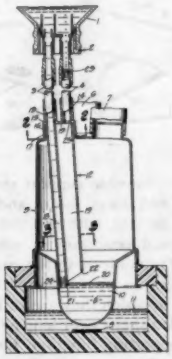
during suction operation. In the preferred embodiment of the invention, suction is initially applied to the area between the bag and the container, and in other embodiments of the invention suction is initially applied into the interior of the bag.

3,746,000

CONTINUOUS FEED MEDICAL NEBULIZER

Frank M. Edwards, Pacific Palisades, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 3, 1972, Ser. No. 214,796
Int. Cl. A61m *15/00*
U.S. Cl. 128—194 **9 Claims**



A continuous feed nebulizer system for medical inhalation therapy in which a rigid dual lumen feed tube is connected with a liquid supply source and extends into a nebulizing chamber. This feed tube continuously replenishes liquid as it is nebulized and has a liquid drain lumen that is of a smaller cross sectional area and extends below an air return lumen. Constricted orifice structures adjacent a bottom of the liquid drain lumen and a top of the air return lumen damp out sudden changes of liquid level in the chamber as this level ranges between a bottom of the liquid drain lumen and a bottom of the air return lumen. This structure causes more uniform nebulization within the continuous feed nebulizer.

3,746,001

PIERCEABLE ACCESS PORT FOR PARENTERAL SOLUTION CONTAINERS

Philip G. Ralston, Jr., Buffalo Grove, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Oct. 20, 1971, Ser. No. 190,875
Int. Cl. A61m *5/14*
U.S. Cl. 128—214 D **5 Claims**

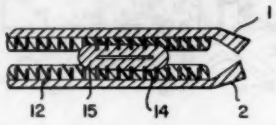
A picerceable access port for parenteral solution containers, including a flexible plastic tube communicating at one end with the interior of the container and closed at its other end to seal the container. A gripping sleeve is positioned about the flexible plastic tube so that the free end of the plastic tube is positioned within the bore of the sleeve. By this arrangement, the free end of the flexible tube defines a puncturable diaphragm within the gripping sleeve accessible to a piercing spike passing through the sleeve to gain access to the container.

3,746,002

ATRAUMATIC SURGICAL CLAMP

Jordan D. Haller, 2603 Avenue, K, Brooklyn, N.Y.

Filed Apr. 29, 1971, Ser. No. 138,653
Int. Cl. A61b *17/28, 17/08;* A44b *21/00*
U.S. Cl. 128—322 **6 Claims**



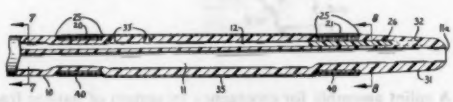
A vascular clamp includes a plurality of elongated jaws operatively connected together for movement from an open position to a clamping position. At least one of the jaws is provided with a resilient gripping member. A plurality of pin members are imbedded into the resilient gripping member and extend generally in the direction of the clamping motion of the jaw on which the resilient gripping member is provided. The inner end of the pin members is fixedly positioned with respect to the jaw on which the resilient member is provided. The length of the pin members is such that their outer ends lie beneath the outer surface of the resilient clamping member when the jaws are in their open position and extend beyond the outer surface of the resilient member when the jaws are in their clamping position. When the jaws are in their clamping position, the object being clamped compresses the resilient member and the pins extend beyond the outer surface of the compressed resilient member and thus grippingly engage the object clamped between the jaws.

3,746,003

MULTI-LUMEN BALLOON CATHETER

Lawrence W. Blake, Newport Beach, Bruce D. Bett, Capistrano Beach, and Clement E. Lieber, Yorba Linda, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 29,889, April 20, 1970, Pat. No. 3,634,924. This application Sept. 23, 1971, Ser. No. 183,104
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B **8 Claims**



A multi-lumen tube is extruded from a thermoplastic material having a memory characteristic. An end portion of the tube is heated sufficiently to soften the plastic and permit the end portion to be drawn out to a reduced diameter. A pair of metal ferrules is placed on the reduced end portion in predetermined positions spaced a short distance apart. Then the reduced portion is heated in relaxed condition cuasing it to re-expand and lock the ferrules in place. Balloon inflation openings are formed communicating with one of the lumens. A sleeve of balloon material is secured by bindings over the ferrules. In one embodiment the tube is limp and the balloon is utilized as a sail to flow carry the catheter through a vein into

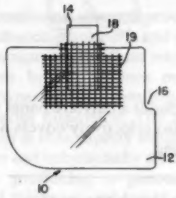
and through the heart and into the pulmonary artery. This application is directed to the article resulting from the described method of manufacture.

3,746,004

DISPOSABLE ELECTRODES FOR ELECTRICAL STIMULATION OF MUSCLES AND NERVES OF THE HEAD

Bernard Jankelson, 1451 Medical Dental Building, Seattle, Wash.

Filed June 14, 1971, Ser. No. 152,620
Int. Cl. A61n 1/04
U.S. Cl. 128—410 **2 Claims**



Disposable electrodes capable of conforming to irregular skin surfaces comprise a flexible, electrically nonconductive planar sheet material having one surface thereof coated with a skin adhesive adapted to be applied directly to the skin of the patient, the nonconductive planar body having a projecting tab to which an electrical connection can be made. A conductive foil sheet is adhered to the adhesive coating of the planar sheet, the foil being contiguous with the tab. A nonconductive planar spacing sheet having a surface area smaller than that of the planar sheet is adhered to the adhesive coated surface of the sheet material to overlap a portion of the foil sheet extending from the tab and leave an exposed area of adhesive around the circumference of the spacing sheet for adhering the electrode to the skin of the patient. The overlapped portion of the spacing sheet and foil creates an opening into the interior of the electrode for injection of a liquid electrolyte after the electrode is applied to the skin. The spacing sheet is preferably a non-conductive fine mesh screen. The electrodes are primarily useful in electrically stimulating the muscle complex that works synergistically to close the human mandible.

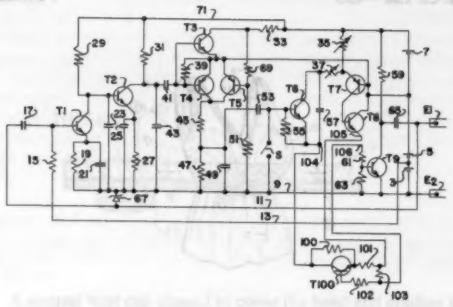
3,746,005

CONSTANT ENERGY HEARTBEAT STIMULATING APPARATUS WITH PULSE WIDTH CONTROL

Sherwood S. Thaler, Lexington, and Barouh V. Berkovits, Newton Highlands, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 162,800, July 15, 1971, and a continuation-in-part of Ser. No. 16,478, March 4, 1970, which is a division of Ser. No. 727,129, April 11, 1968, Pat. No. 3,528,428. This application July 19, 1971, Ser. No. 163,619
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P **8 Claims**

Pulse-width controlled heartbeat stimulating apparatus. The apparatus includes an electrical power supply and a pulser for generating stimulation pulses on terminals connected to a patient's heart. An integral control is provided for automatically varying the width of the stimulation pulses as a function of the power supply (energy source) value to maintain the energy output above a predetermined level. The present invention can be used with many types of heart simulating devices including extra-corporeal pacers, but is particularly useful when utilized with non-accessible or implanted pacers. In an illustrative embodiment, a circuit is provided for indicating the approximate amount of remaining power supply life and for controlling energy supplied to the heart with each stimulation pulse to greater than a minimum required value regardless of energy source variation.

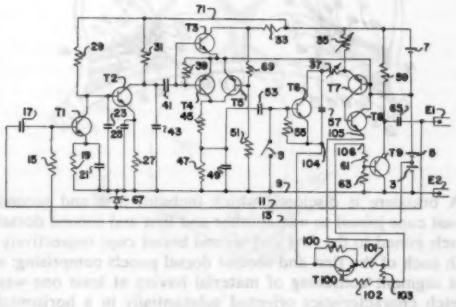


3,746,006

CONTROLLED ENERGY OUTPUT PACER

Sherwood S. Thaler, Lexington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 15, 1971, Ser. No. 162,800
Int. Cl. A01n 1/36
U.S. Cl. 128—419 P **5 Claims**



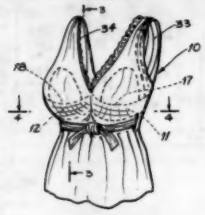
A controlled energy output pacer. The apparatus includes an electrical power supply and a pulser for generating stimulation pulses on terminals connected to a patient's heart. An integral control is provided for automatically controlling the stimulation pulses as a function of power supply (energy source) value to maintain the energy output above a predetermined level. The present invention can be used with many types of heart stimulating devices including extra-corporeal pacers, but is particularly useful when utilized with non-accessible or implanted pacers. In an illustrative embodiment, a circuit is provided for indicating the approximate amount of remaining power supply life and for controlling energy supplied to the heart with each stimulation pulse to above a minimum required value regardless of energy source variation.

3,746,007

SLEEPING GARMENT

Hi Hand, Los Angeles, and Angela C. Serritella, Rosemead, both of Calif., assignors to said Hi Hand by said Serritella

Filed Apr. 10, 1972, Ser. No. 242,414
Int. Cl. A41c *3/08*; A41b *9/00*
U.S. Cl. 128—455 **7 Claims**



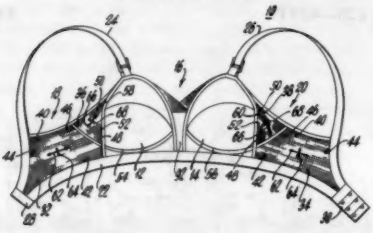
A ladies sleeping garment having the elements of a support brassiere therein. The garment will support and mold the breast even when the wearer is in an unusual position.

3,746,008

BRASSIERE

Jack J. LoCascio, Bayonne, and Edward Astor, Fort Lee, both of N.J., assignors to International Playtex Corporation, New York, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,434
Int. Cl. A41c *3/00*
U.S. Cl. 128—498 **17 Claims**



A brassiere is disclosed which includes first and second breast cups joined to one another and first and second dorsal panels joined to the first and second breast cups respectively, with each of the first and second dorsal panels comprising: a first segment consisting of material having at least one-way stretch characteristics oriented substantially in a horizontal direction when the brassiere is worn by the wearer, and a second segment joined to the first segment and to the outer side edge of the respective one of the breast cups, with the second segment of each dorsal panel consisting of material having primary stretch characteristics in one direction angularly oriented with respect to the said horizontal direction. With this arrangement, the first segment of the dorsal panels are principally subjected to tension when the brassiere is placed on the body of the wearer, and the horizontal tensile forces are channeled to the lowermost region of the first segment of the dorsal panel. When the arms are lifted, the distensible second segments of the dorsal panel are available to accomodate the ensuing body movements. The second segment of each dorsal panel cooperates with the selectively oriented stretch characteristics of a portion of the center arrangement which joins the breast cups to one another to permit relatively independent action of each breast cup in response to movement of one or both of the woman's arms.

3,746,009

DERRIERE PANEL PANTY GIRDLE

Concetta L. Cuozzi, Yorktown Heights, N.Y., assignor to Munsingwear, Inc., Minneapolis, Minn.

Filed June 1, 1971, Ser. No. 148,608
Int. Cl. A41c *1/00*
U.S. Cl. 128—529 **2 Claims**

A panty girdle includes a derriere panel which provides buttocks control and also selectively covers a body function permitting crotch opening.

3,746,010

TOBACCO PRODUCT

John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 11, 1972, Ser. No. 280,052
Int. Cl. A24b *03/12*
U.S. Cl. 131—17 R **13 Claims**

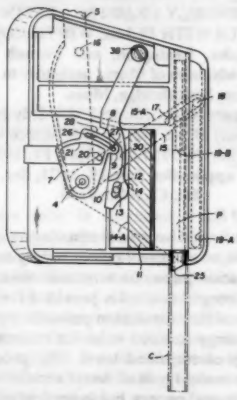
The specification discloses the addition of 2, 4,4-trimethyl - 3- (3 -oxo -1- butenyl) -2-cyclohexen- -1- one; 3-(3 hydroxy - 1- butenyl) -2, 4, 4-trimethyl -2- cyclohexen -1- one; 3-(3-hydroxy-1- butenyl)-2, 4, 4-trimethyl -2- cyclohexen -1- ol; and 2, 4, 4-trimethyl -3- (3- oxo-1- butenyl) -2- cyclohexen -1- ol to tobacco to enhance the flavor and/or aroma thereof.

3,746,011

MANUALLY OPERABLE CIGARETTE MAKING DEVICE

Otto Kappeler, and Rudolf Messner, both of Trossingen, Germany, assignors to EfKa-Werke Fritz Klehn GmbH, Trossingen/Wurtt., Germany

Continuation-in-part of Ser. No. 824,529, May 14, 1969, abandoned. This application Apr. 19, 1971, Ser. No. 134,998
Claims priority, application Germany, May 16, 1968, P 17 57 504.1; May 16, 1968, P 17 57 503.0
Int. Cl. A24c *05/42*
U.S. Cl. 131—70 **14 Claims**



A manually operable device for making cigarettes. Loose tobacco is compressed into a rod, which can subsequently be

stuffed into a cigarette tube. Positive and non-yielding linkage is provided not only for performing the tobacco compressing motion, with concentrated and properly directed power, but also for required return motion of the compression members, thereby avoiding trouble due to hanging up of compression members on accumulation of loose tobacco in the operating mechanism.

3,746,012

METHOD OF MAKING EXPANDED RECONSTITUTED TOBACCO

Edward John Deszyck, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jan. 17, 1972, Ser. No. 218,488
Int. Cl. A24b *3/18*
U.S. Cl. 131—140 P **8 Claims**

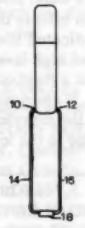
An expanded reconstituted tobacco product is produced by forming a slurry of tobacco plant parts and a binder of tobacco derived pectins in an aqueous medium into which a relatively small amount of low boiling alkanes or volatile aliphatic hydrocarbons are dispersed. An emulsifying agent may be added to obtain a better dispersion. The mixture is cast into sheet or web form and is then rapidly heated to a temperature sufficient to volatilize out substantially all of the hydrocarbons and water thereby producing a porous spongy tobacco product of increased thickness and lower density than an untreated reconstituted tobacco.

3,746,013

LIGHTER AND PIPE TAMPER DEVICE

Arvid Larson, 6560 Winfield Boulevard, Margate, Fla.

Filed May 3, 1972, Ser. No. 249,798
Int. Cl. A24f *09/02*
U.S. Cl. 131—247 **4 Claims**



A lighter with a combination pipe packer and cover lock. The lighter includes a case with a main body and a movable cover that is connected to the main body by a hinge. The pipe pusher includes an arm pivotally connected to each side of the lighter case adjacent the bottom of the main body, and a generally flat plate connected between the distal ends of said arms. The length of said arms are sized to allow the plate to engage the top of the cover when the pipe packer is placed in a latching position.

3,746,014

CIGARETTE FILTER

Ival O. Salyer, Dayton, and Robert T. Jefferson, West Carrollton, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed May 4, 1971, Ser. No. 140,286
Int. Cl. A24b *15/02*
U.S. Cl. 131—269 **10 Claims**

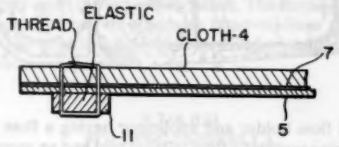
An open-pore polyurethane having a porosity of at least 50 percent and a density of from 0.1 to 0.5 grams per cubic centimeter was found to be particularly effective as a smoke filter for tobacco products. The polyurethane contains coherent spherical particles of less than 10 microns diameter which are separated by interconnecting interstices.

3,746,015

NATURAL HEAT CAP

Stanley W. Schulman, 2 Maplewood Lane, Roslyn, N.Y.

Filed July 2, 1971, Ser. No. 159,197
Int. Cl. A45d *20/18*
U.S. Cl. 132—9 **5 Claims**



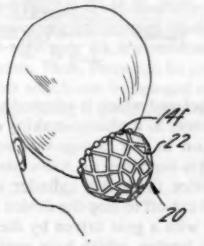
A natural heat cap shaped to cover the head and confine the hair and scalp of the wearer comprising an outer layer of pliable material, an inner layer of pliable material secured to said outer layer, the inner surface of said inner layer being highly reflective, and fastening means on said cap for holding at least the marginal edges of said cap tightly about the head of the user.

3,746,016

ELASTIC SNOOD

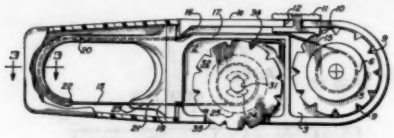
Abraham Goodman, 112 Avon Dr., Essex Fells, N.J.

Filed Jan. 21, 1971, Ser. No. 108,288
Int. Cl. A45d *8/00*
U.S. Cl. 132—46 R **2 Claims**



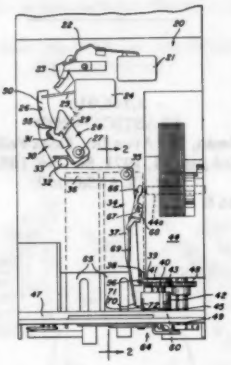
The disclosed articles to be worn encircling part of the person comprise an endless band of highly elastic material, e.g., molded styrene-butadiene block copolymer, having bodies and connecting necks extending integrally between the bodies. The band is easily stretched considerably to put it on, and the bodies are easily grasped when putting the ring on and taking it off. The necks can be stretched five times their normal length without suffering permanent elongation, and because of this feature the necks which in aggregate are short provide an ample amount of stretch. One novel article is a snood including a ring of homogeneous necks and balls and a pouch formed of a pattern of strands (which may also be necks and balls) extending integrally from the ring, the pattern and proportions of the pouch making it more readily stretched than the ring, to confine a bun of hair without excessively compacting the bun.

3,746,017
DENTAL FLOSS HOLDER AND APPLICATOR
James S. Casselman, 8232 East Coolidge St., Scottsdale, Ark.
Filed Feb. 14, 1972, Ser. No. 226,010
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 A **10 Claims**



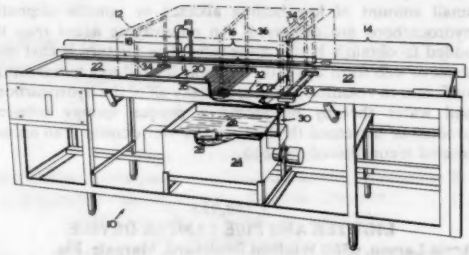
A dental floss holder and applicator having a floss storage and dispensing reel and a floss take-up reel and an arcuate arm to hold floss in application position.

3,746,018
CHANGE MAKING DEVICE
Wilson M. Stewart, Ottawa, Ontario, Canada, assignor to Vendall Machines Limited, Ottawa, Ontario, Canada
Filed Oct. 26, 1971, Ser. No. 192,056
Int. Cl. G07d *1/00*
U.S. Cl. 133—4 A **9 Claims**



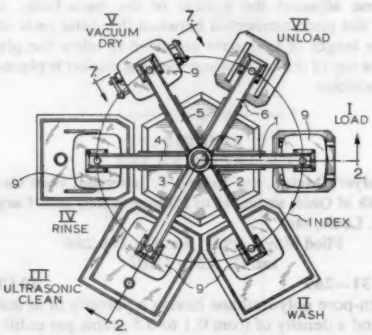
A device is disclosed which is adapted to cut off the flow of energization current to a change-making device when it continues to function in the change-making cycle, instead of stopping when it is supposed to. Associated with a motor that operates the device there is a cylinder and piston arrangement. The initial cut-off to stop the device is effected by a cam lobe, associated with a gear driven by the motor, actuating a lever that moves latches, which have ensnared a switch lever arm, to free the switch lever arm. When the switch lever arm becomes jammed or the normally open switch attached to the arm remains in the closed position for any reason, a cam lobe, formed on the cylinder which is moved from an inoperative to an operative position when rotated in unison with the first mentioned cam, wipes the actuating button of a normally closed switch, which is incorporated in the motor energizing circuit in series with the initial actuating switch, to break the circuit and shut the machine off. The cylinder is slidably mounted on a piston which is provided with a cam track that co-acts with a cam follower formed in the cylinder to raise the cylinder from an inoperative to an operative position. In normal operation the cam follower leaves the cam track and the cylinder descends from the operative position before the cam lobe thereon has reached the actuating button of the normally closed switch. The cylinder, however, has a lateral projection and a wire rod engages under this projection to maintain the cylinder in the operative position after the cam follower has left the cam track, if the motor continues to run after it should have been stopped. The wire rod is normally biassed to a position under the projection, it forming the lower part of a pivotally mounted arrangement, the upper part of which is normally spaced from an end of the motor armature. The motor is of the type which has a longitudinally movable armature and the latter moves to hold the wire rod in its normal position when the motor is energized. If the motor is de-energized at the proper time, the wire rod is simply displaced by the projection as the cylinder descends.

3,746,019
WASHING APPARATUS
William A. Hansen, Winnipeg, Manitoba, Canada, assignor to The Paul Moore Company Limited, Manitoba, Canada
Division of Ser. No. 858,317, Sept. 16, 1969, Pat. No. 3,601,144. This application May 4, 1971, Ser. No. 140,109
Int. Cl. B08b *3/02*
U.S. Cl. 134—56 D **3 Claims**



A liquid level controlling device is described which is particularly suited for use in conveyor- or straight-through types of glass washers and dish washers. A float indicates the liquid level of wash solution in a tank, and is operatively connected to a diverter trough which effects the transfer of liquid to the tank in response to an indicated low level, and from the tank in response to an indicated high level of wash solution. A simple mechanical linkage, or a fluid connection using an incompressible fluid or the like, is employed in order to cause a corresponding movement of the diverter trough to any movement of the float due to a change in the level of wash solution in the tank.

3,746,020
SEALING LAND CLEANING MACHINE
Raymond J. Pekosh, Niles, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Division of Ser. No. 71,538, Sept. 11, 1970. This application Mar. 3, 1972, Ser. No. 231,654
Int. Cl. B08b *3/10;* **B67c** *1/12*
U.S. Cl. 134—79 **2 Claims**



An apparatus for use in the manufacture of a color cathode-ray tube of the type comprising a glass faceplate panel section to be frit sealed to another envelope section containing an

electron gun system for energizing a phosphor screen deposited on the faceplate panel section comprises a rotatable turret having a plurality of radially extending support arms for holding faceplate panel sections in an inverted position with the sealing lands extending downwardly. A plurality of stationary operating stations are circumferentially spaced around the turret which has a means for rotating it and sequentially indexing the support arms in cooperative relationship with the operating stations. An ultrasonic cleaning apparatus at one of the stations receives the sealing land of the faceplate panel section held by the cooperating support arm in a liquid cleaning bath and ultrasonically agitates the cleaning bath. A rinsing apparatus at a subsequent operating station receives the sealing land in deionized water and effects localized forced circulation of the deionized water at its interface with the sealing land.

3,746,021

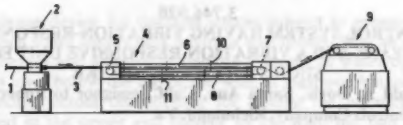
DEVICE FOR COOLING AN ELECTRIC WIRE INSULATED BY EXTRUSION

Asko S. Riekkinen, Kirkkonummi, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed July 13, 1970, Ser. No. 54,128

Int. Cl. B05b *1/14*; **B65h** *57/10*; **B08b** *3/02*

U.S. Cl. 134—122 **1 Claim**



A device for cooling an electric wire during coating of the wire with an extruded plastic insulation. The wire is subjected to jets of cooling water which are directed substantially in the advancing direction of the wire.

3,746,022

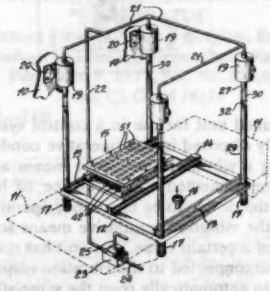
WASHING MACHINE FOR MEDICAL AND LABORATORY EQUIPMENT

Paul-Henri Fillion, Ste-Foy, Quebec, and Viateur Guay, Charlesbourg, Quebec, both of Canada, assignors to Hoplab Inc., Quebec, Canada

Filed Feb. 8, 1971, Ser. No. 113,487

Int. Cl. B08b *3/02*, *9/08*

U.S. Cl. 134—141 **2 Claims**



This invention is a washing machine for medical and laboratory equipment with an equipment holding tray slidable into and out of the machine on either side thereof and provided with a manifold which connects to a washing fluid source when a frame, on which the tray is mounted, is moved down by hydraulic cylinders against the action of springs.

3,746,023

METHOD FOR CLEANING OIL TANKER HOLDS

Billy E. Smith, Darien, Conn., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 70,046, Sept. 8, 1970, abandoned. This application Mar. 22, 1972, Ser. No. 237,669

Int. Cl. B63b *57/02*; **B08b** *9/00*

U.S. Cl. 134—22 R **5 Claims**

The hold in an oil tanker which has been emptied of its oil cargo is cleaned by first filling the hold with sea water ballast so that oil vapors are forced from the hold and a residual oil layer floats upon the sea water ballast. The floating oil layer is thereupon skimmed or otherwise removed from the aqueous ballast. The hold is then deballasted and washed with a jet of high pressure sea water.

3,746,024

FOLDING UMBRELLA

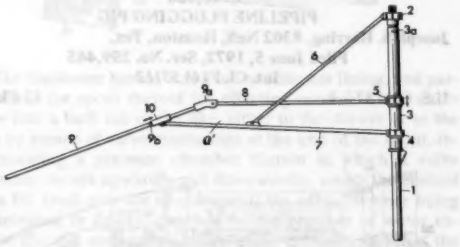
Nobutoshi Kida, 1-27 Minami Nonin-cho Higashi-ku, Osaka, Japan

Filed June 23, 1972, Ser. No. 265,435

Claims priority, application Japan, Oct. 21, 1971, 46/96735

Int. Cl. A45b *25/14*, *25/16*

U.S. Cl. 135—20 **6 Claims**



A folding umbrella which comprises a connecting rib and a receiving rib that are held at a substantially right angle to a center rod. Said connecting rib crosses freely and slidably a support rib and the receiving rib is connected to an end rib through a sliding means. Thus, there can be provided a folding umbrella at a low cost which can be opened with a little force and folded neatly presenting a good appearance in its open position.

3,746,025

AUTOMATIC OPENABLE UMBRELLA

Keiichi Murata, Daitoh-ku, Tokyo, Japan, assignor to Kabushiki Kaisha Ideal, Tokyo, Japan

Filed Dec. 28, 1971, Ser. No. 212,904

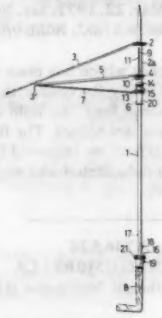
Claims priority, application Japan, Apr. 1, 1971, 46/19872; Apr. 16, 1971, 46/24379

Int. Cl. A45b *25/16*

U.S. Cl. 135—22 **11 Claims**

The frame of a self-opening umbrella has a hollow shaft, a handle on one end of the shaft and a first ring fixed on the other end. A second ring slides along the shaft toward and away from the first ring and is biased away from the first ring by a helical compression spring in the shaft. A third ring slides on the shaft between the second ring and the handle. A first set of long ribs, normally carrying the cloth canopy of the umbrella, is pivoted to the first ring, and shorter second and third ribs are respectively pivoted to the second and third rings and

connected to a common hinge on an associated first rib. The spring tends to open the umbrella, and the umbrella may be closed manually by pulling the third ring toward the handle and locking it in its umbrella closing position.

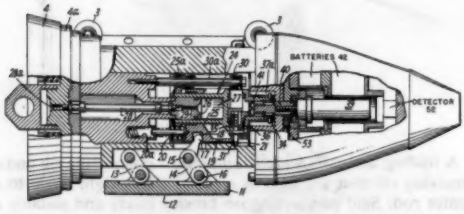


3,746,026

PIPELINE PLUGGING PIG

Joseph S. Herring, 8302 Neff, Houston, Tex.

Filed June 5, 1972, Ser. No. 259,445
Int. Cl. F16l *55/12*
U.S. Cl. 137—1 **12 Claims**



A pipeline blocking pig to be propelled through a pipeline and stopped by an external command at a desired location to block the flow of fluid through the pipeline. Work functions of stopping the pig and sealing the pipeline are performed, respectively, by first spring means in pig and pipeline fluid under pressure. Pipeline fluid under pressure utilized to store energy in second spring means. Second spring means utilized to release pig and store energy in first spring means. Only minimum of self-contained electrical energy is required to initiate the release and transfer of stored energy from and between the two spring means.

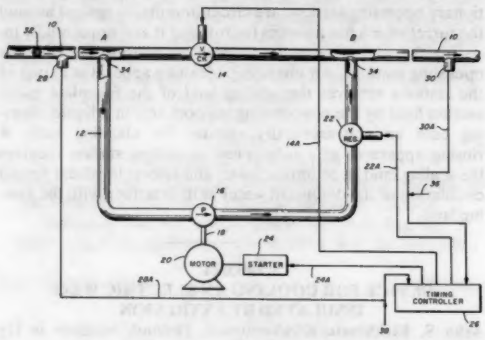
3,746,027

PUMP STATION

Robert E. Elliott, Tulsa, Okla., assignor to FWI, Inc., Tulsa, Okla.

Filed Oct. 4, 1971, Ser. No. 186,245
Int. Cl. B08b *9/04*; F04b *23/00*
U.S. Cl. 137—1 **7 Claims**

Method and apparatus for a pipeline station including a power-assisted check valve in the pipeline, a bypass line around the check valve, a motor-driven pump in the bypass line and a power-operated valve in the bypass line in series with and downstream of the pump, including means, when it is desired to start the pump, of first applying a closing force on the check valve to move it towards the closed position, starting the pump, and opening the bypass valve, the steps being conducted in time-spaced sequence.

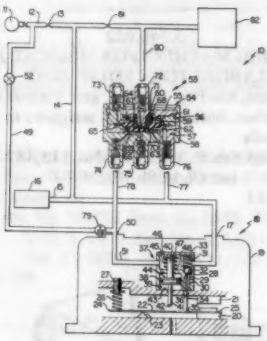


3,746,028

CONTROL SYSTEM HAVING VIBRATION-RESPONSIVE MEANS AND A VIBRATION-RESPONSIVE UNIT FOR SUCH SYSTEM OR THE LIKE

Donald A. Doyle, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 10, 1971, Ser. No. 151,653
Int. Cl. F16k *17/36*
U.S. Cl. 137—38 **18 Claims**



A self-contained unit for use in a control system having a device normally disposed in one operative condition thereof, the unit having a vibration responsive means adapted to be operatively interconnected to the device to be unset and thereby cause the device to be in another operative condition thereof when the vibration responsive means senses a vibration in excess of a certain value. The unit has resetting means operatively interconnected to the vibration responsive means to be adapted to automatically reset the same after the vibration responsive means has sensed one shock in excess of the certain value to prevent that one shock from effectively causing the device to be in the other condition thereof while being ineffective thereafter to reset the vibration responsive means if another excessive shock is sensed by the vibration responsive means within a certain time period after the occurrence of first excessive shock.

3,746,029

RELEASE DEVICE FOR FLOODING SPACES SUBJECTED TO PRESSURE

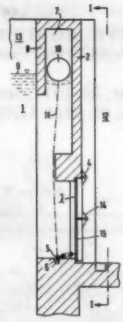
Peter Rissler, Johlingen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Aug. 23, 1971, Ser. No. 173,745

Claims priority, application Germany, Aug. 22, 1970, P 20 41 791.8

Int. Cl. F16k *17/36*

U.S. Cl. 137—81 **2 Claims**



Release device for flooding spaces subject to pressure includes a water supply tank having a wall formed with an opening therein and adapted to contain a supply of water up to a given level below the top of the wall, at least one hinged flap extending across the opening for closing the opening and hinged at the upper end thereof to the wall, the flap being openable toward the outside of the tank, tow hook means secured at one end thereof to the lower end of the hinged flap and at the other end thereof in a recess formed in the wall, the wall being formed with a chamber located above the hinged flap and communicating with the interior of the tank, the chamber being adapted to contain water up to the given level and air above the given level and including a partition extending from the top of the wall to a location below the given water level, float means disposed in the chamber so as to float at the given level on water contained in the chamber, and a pull rope connecting the float means and the tow hook for lifting the tow hook to open the hinged flap when a pressure increase occurs in the air above the water in the interior of the supply tank causing the given level of water in the interior of the tank to drop and the given level of water in the chamber to rise.

3,746,030

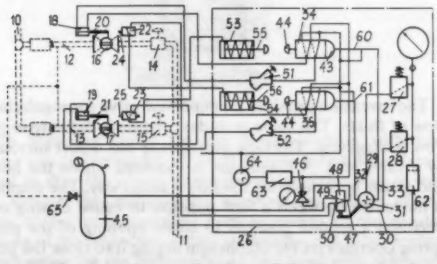
CONTROL SYSTEM FOR GAS PRESSURE REGULATING APPARATUS

Edmund Norman Dawber, Market Drayton, England, assignor to Serck Industries Limited, Birmingham, England

Filed Sept. 8, 1971, Ser. No. 178,676

Int. Cl. G05d *16/16*

U.S. Cl. 137—110 **10 Claims**



A control system for a pair of parallel pressure regulators which are together in series in a gas conduit includes a pair of shut-off valves immediately upstream of the respective regulators, the valves being actuable in response to signals from a pair of devices which are themselves operable at a pair predetermined pressures of the gas downstream of the regulators. Each one of the valves has a detector which can control the other of the valves so that when one valve is shut the other valve is urged open.

3,746,031

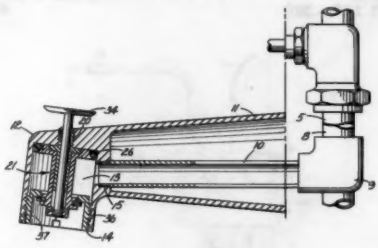
SPOUT CONSTRUCTION FOR DIVERTER

Gerald E. Christiansen, Flora, Ind., assignor to Stephen A. Young, Monticello, Ind.

Filed Oct. 26, 1971, Ser. No. 192,384

Int. Cl. F16k *31/44*

U.S. Cl. 137—119 **3 Claims**



The disclosure hereof is of a tub and shower fitting, and particularly the spout thereof for effecting control of the water flow into a bath tub or the like, either to the shower or to the tub by means of valve mechanism at the end of the spout, incorporating a pressure chamber therein in which a valve member moves upwardly and downwardly, under the control of a lift knob exterior of the spout, the valve member being maintained in upward position by the pressure of water exerted thereon and sealing means being provided therefor, the lower end of the valve member having a seal section cooperating with a seat opening, this seat opening is of smaller diameter than the head previously mentioned, a suitable venting means being provided to direct air above the head to facilitate breaking the seal and permitting the water to flow through the seat opening into the tub as alternately desired in operation.

3,746,032

PNEUMATIC LIQUID DISPOSAL SYSTEM

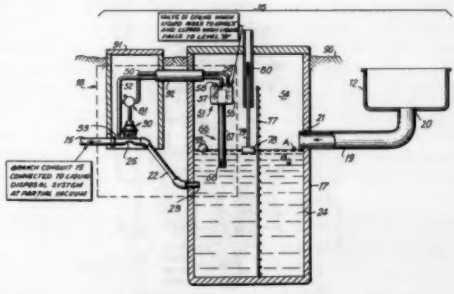
Harald Anton Ake Wallgren, Alvsjo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Aug. 4, 1971, Ser. No. 168,975

Claims priority, application Sweden, Aug. 20, 1970, 11331/70

Int. Cl. F16k *31/18*

U.S. Cl. 137—205 **17 Claims**



Waste liquid is discharged pneumatically into a liquid disposal system through a discharge conduit from an outlet of a vessel which receives such waste liquid. Flow control

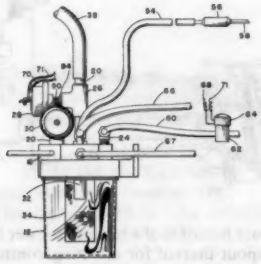
mechanism is operatively associated with the discharge conduit which controls the flow of liquid from the vessel and normally functions to maintain the liquid level in the vessel at a level above the level of the outlet. When the flow control mechanism malfunctions and the liquid falls to a level at the vicinity of the outlet and at such time the discharge conduit is in communication with the system and at a partial vacuum, a body capable of floating in the liquid is drawn by suction toward the outlet in airtight sealing relation therewith, so that flow of air from the vessel into the system will be prevented.

3,746,033

INTRA-ORAL EVACUATOR SYSTEM

Arthur S. Keiper, II, Newberlinville, Pa., assignor to Dentsply International Inc., York, Pa.

Filed Aug. 5, 1971, Ser. No. 169,196
Int. Cl. A61c *17/04*
U.S. Cl. 137—205 **4 Claims**



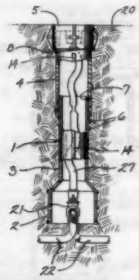
A dental oral evacuating system which includes a receptacle unit through which liquid and solid waste material passes after withdrawal from the oral cavity and means to connect the receptable to a source of flushing liquid for said receptacle. The system is connectable to a source of vacuum to effect such withdrawal of waste and a pressure-actuated switch in series with an electro-magnetically actuated valve, which controls the flow of flushing liquid to the receptacle, shutting off such flow unless the negative pressure in the receptacle is greater than a predetermined minimum amount to insure the delivery of flushing water only when suction is available to withdraw it from said receptacle.

3,746,034

INSTALLATION OF CURB BOXES

Harold E. Cosson, Sheboygan, Wis., assignor to Ametek, Inc., Sheboygan, Wis.

Filed June 9, 1971, Ser. No. 151,398
Int. Cl. F16l *9/00*
U.S. Cl. 137—364 **13 Claims**



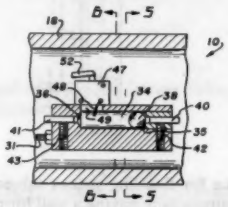
A non-metallic curb box is formed to provide detectable metallic means distributed longitudinally along at least a major part of the upper portion thereof. The metallic means may be either magnetic or non-magnetic, depending upon the type of detector to be used. It may also be continuous or discontinuous. The box is then installed in the ground in valve protecting position, and is positioned vertically so that if an upper portion of the box is sheared off or otherwise accidentally removed, the remaining box portion will be detectable because of the presence of a portion of the detectable metallic means thereon.

3,746,035

FLOAT LEVEL CONTROL APPARATUS

Ernst Singer, 3491 Puget Drive, Vancouver, British Columbia, Canada

Filed Mar. 24, 1971, Ser. No. 127,670
Int. Cl. F16k *31/08, 31/02*
U.S. Cl. 137—416 **8 Claims**



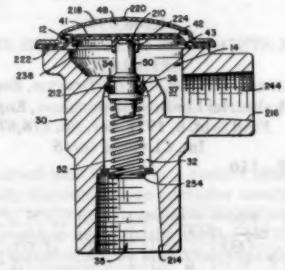
Level control apparatus including a float chamber connected to a vertically adjustable anchor point so that the chamber swings between an upper position and a lower position as the level of the liquid in which the chamber is located rises and falls. An operating unit or ball moves back and forth along a passage connected to the float chamber as the attitude of the latter changes, to operate control means during this movement.

3,746,036

DIAPHRAGM VALVE

Chester G. Du Bois, Zion, and Paul R. Hunt, Lindenhurst, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 2, 1970, Ser. No. 85,954
Int. Cl. F16k *15/14*
U.S. Cl. 137—496 **1 Claim**



The invention provides an improved valve for regulating the flow of fluids. The valve includes a housing defining in part a flow passageway. The flow passageway has a port surrounded by a valve seat. A diaphragm is mounted within the housing and assists in completing the flow passageway. The diaphragm is moveable between a first position to cause closing of the port and a second position to cause opening of the port. A spring operates on the diaphragm urging it to close the port. A suction force operates on the same side of the diaphragm as the spring creating a pressure differential on opposite sides of

the diaphragm. The pressure differential is effective to overcome the action of the spring thereby displacing the diaphragm to an open position and allowing flow of fluid through the port.

3,746,037

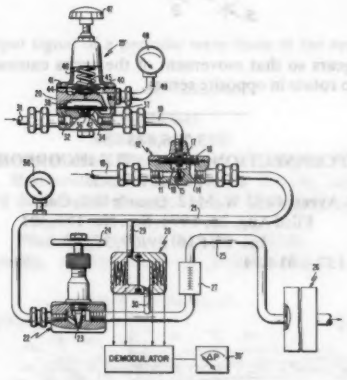
FLOW CONTROL AND MONITORING SYSTEM

Frank E. Boerger, and William H. White, Jr., both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 762,876, Sept. 26, 1968. This application Oct. 6, 1971, Ser. No. 187,206

Int. Cl. G05d *7/00*

U.S. Cl. 137—487.5 **7 Claims**



The mass flow rate of a fluid is controlled in response to the pressure differential across a restriction in the conduit and in response to the incoming pressure of the fluid. The flow control system includes means to change the fluid flow through the conduit in accordance with desired changes in the mass flow rate through the conduit.

3,746,038

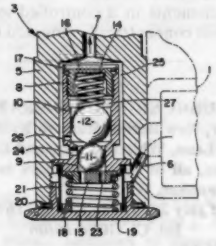
FUEL HEAD COMPENSATING VALVE FOR FUEL INJECTION NOZZLE

Harold C. Simmons, Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 25, 1971, Ser. No. 109,113

Int. Cl. F16k *15/04*

U.S. Cl. 137—513.5 **2 Claims**



Flow metering valves for use in conjunction with fuel sprayer nozzles mounted on vertical ring manifolds characterized in that the valves compensate for difference in fuel head around the manifold by equating the effects of the masses of the valve operating parts according to the angular positions of the respective valves around the manifold thereby compensating for the differences in fuel head with reference to a datum pressure in a horizontal plane passing through the center of the manifold. The valves herein are further characterized in that the movable valve parts whose masses balance fuel head differences around the fuel manifold comprise a plurality of balls to minimize sliding friction, one of the balls of each valve constituting a metering valve member which moves in the valve to vary the area of a metering slot therein, said ball being thus moved by fuel pressure while in contact with another ball which is spring actuated tending to decrease the area of the metering slot.

3,746,039

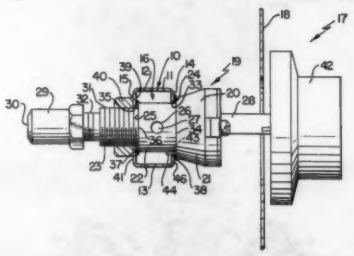
FUEL CONTROL DEVICE MOUNTING ARRANGEMENT WITH A FUEL SUPPLY MANIFOLD

Roy C. Demi, Greensbury, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 20, 1971, Ser. No. 145,272

Int. Cl. F16k *51/00*

U.S. Cl. 137—561 R **10 Claims**



A manifold defined by an annular wall providing a fuel supply passage in the manifold and having a pair of openings passing therethrough on each side of the manifold. A control device is disposed in the openings so as to have one part thereof on one side of the manifold and another part thereof projecting out of the opposite side of the manifold with an intermediate part of the control device disposed inside the manifold, the control device having means for conveying fuel adjacent the intermediate part thereof out through the projecting part thereof and being secured to the manifold in a stacked and sealed relation therewith.

3,746,040

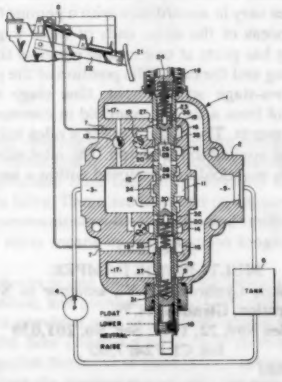
DIRECTIONAL CONTROL VALVE

John C. Paul, West Richmond Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 19, 1972, Ser. No. 245,451

Int. Cl. F16k *11/07*

U.S. Cl. 137—596 **6 Claims**



A four-way spool valve assembly embodying a regenerative circuit for controlling the actuation of a double acting fluid

motor for a bulldozer blade or the like characterized in that the spool has therewithin a relief valve and a check valve respectively operative to build up back pressure in the return line from the rod end of the motor during the blade lowering operation and to permit return flow under such back pressure into the inlet port to prevent cavitation of the head end of the motor, and further characterized in that the spool has a float position in which a bypass passage in the assembly is open for flow of fluid from the inlet passage to the return passage and in which both motor ports have unrestricted communication with the return passage.

3,746,041

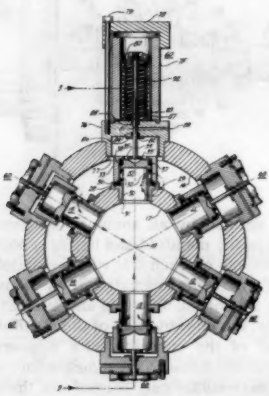
FLUID FLOW CONTROL SYSTEM

Harry Friedland, Las Vegas, Nev., assignor to Process Systems, Inc., Las Vegas, Nev.

Filed Feb. 1, 1971, Ser. No. 111,945

Int. Cl. F16k *47/10*

U.S. Cl. 137—599 **26 Claims**



A plurality of individually actuatable, bistable, digital valve elements interconnect an upstream chamber and a downstream chamber. Each valve element has a stationary cylindrical cage disposed in the upstream chamber and an axially movable cylindrical plug disposed around the cage. The interior of the cage is open at one end to communicate with the downstream chamber and has a perforated side wall to communicate with the upstream chamber. The resultant areas of the perforations in the side walls of at least some of the respective cages vary in accordance with a geometric progression, and the areas of the open ends of these cages are the same. The plug has ports at one end to equalize the pressure between the plug and the cage. The position of the plug is controlled by a two-stage arrangement. One stage is a piston driven by a fluid from a supply manifold in common with the other valve elements. The other stage is a pilot valve for controlling the fluid applied to the piston. The pilot valves and the common supply manifold are enclosed within a unitary housing.

3,746,042

MULTI-BLADE DAMPER

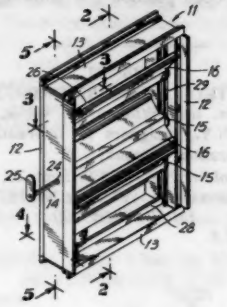
Nathan B. Finkel, Lynbrook, N.Y., assignor to Swift Sheet-metal Corporation, Glendale, N.Y.

Filed Nov. 22, 1971, Ser. No. 201,039

Int. Cl. F24f *7/00*

U.S. Cl. 137—601 **4 Claims**

A multi-blade damper is moved between open and closed positions by pinion gears and racks joined together for conjoint motion. The racks lie on opposite sides of adjacent



pinion gears so that movement of the racks causes adjacent blades to rotate in opposite senses.

3,746,043

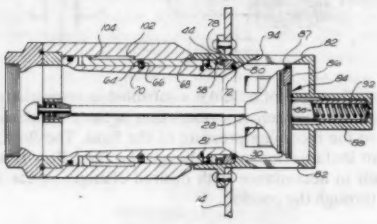
FLUID CONNECTION APPARATUS INCORPORATING CONTROL VALVE

David B. Ayres, 4633 W. M12, Quartz Hill, Calif.

Filed Aug. 26, 1971, Ser. No. 175,301

Int. Cl. F16l *29/00, 37/28*

U.S. Cl. 137—614.04 **7 Claims**



A fluid coupling apparatus is disclosed, as to include mating male and female members. Valve means affixed in both the male nozzle and the female receptacle close the passage through the connection apparatus until a mating engagement is established. A valve actuator apparatus is locked to prevent movement of the valves until the members are sealed together, after which, the actuator member may open and close the valve means. In the disclosed embodiment, a locking or mechanical coupling member of the nozzle along with the valve actuator and a fluid sealing member comprise three concentric tubular elements in a controlled-sequence structure with a valve poppet concentrically mounted therein.

3,746,044

FLUIDIC SIGNAL GENERATOR

Wencel J. Velicer, New Berlin; Ramesh Krishnaiyer, Cudahy; Michael B. McLean, Whitefish Bay, and Donald J. LaMore, Jr., Wauwatosa, all of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

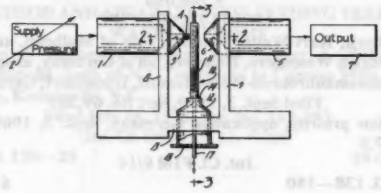
Filed July 29, 1971, Ser. No. 167,213

Int. Cl. G05d *16/06*

U.S. Cl. 137—624.14 **11 Claims**

A free fluid stream is established between a supply nozzle and a receiving nozzle. A hollow needle is fixedly mounted at one end and projects through the stream to define a cantilevered spring beam. The needle is offset slightly from the stream axis. A solid rod corresponding to the internal diameter of the needle is adjustably positioned within the hollow needle to control the spring characteristic. The hollow needle is deflected by the stream and returned into interfering rela-

tionship by the energy stored in the needle and internal rod to produce a periodic mechanical motion and a time varying



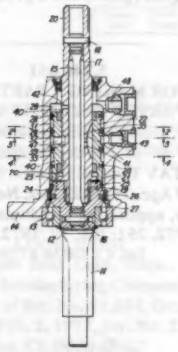
fluidic output signal of a periodic wave form at the receiving nozzle.

3,746,045

SERVO VALVES

Kenneth James Bunker, Bedfordshire, and Martin Ronald Wright, Hertfordshire, both of Great Britain, assignor to Alford & Alder (Engineers) Limited, Hertfordshire, England

Filed May 14, 1971, Ser. No. 143,395
claims priority, application Great Britain, May 18, 1970, 24017/70
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.24 **6 Claims**



The servo valve for a power steering mechanism is described in which the valve comprises a rotor connected to a sleeve of a torsion valve, ports being provided in the rotor and sleeve to supply hydraulic fluid under pressure to a steering ram, the arrangement of the ports being such that there is a resultant radial force, caused by the hydraulic pressure, which inhibits radial oscillation of the rotor relative to the sleeve.

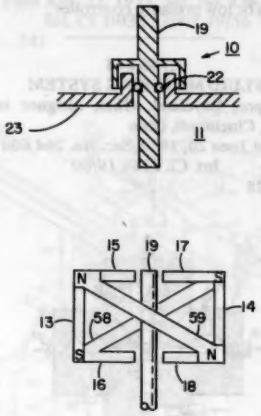
3,746,046

DRY TORQUE MOTOR SERVO VALVE

Joseph J. Werner, Minneapolis, and Elias J. Amdur, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1971, Ser. No. 209,899
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.61 **7 Claims**

A servo valve is disclosed having a dry electrical torque motor operating an armature which controls a flapper valve, an o-ring for sealing the dry torque motor from the flapper valve, a boost valve responsive to the output from the flapper valve, and a feedback spring responsive to the movement of the boost valve for repositioning the armature controlling the flapper valve. Moreover, the electrical torque motor includes



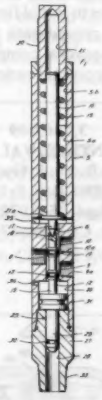
a pair of low reluctant bars joining the like poles to increase the electromotive force exerted upon the armature.

3,746,047

HIGH OR LOW PRESSURE CUTOFF CONTROL VALVE

Clifford M. Peters, 16 Rockwall Drive, Longview, Tex.

Filed Sept. 7, 1971, Ser. No. 178,138
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.66 **2 Claims**



A valve for shutting off a fluid pressure medium in response to pressure variations in a flow conduit wherein a valve body with a longitudinal bore therein is provided with slide valve means in the bore. There are inlet and outlet port means in the body that communicate with the bore and resilient means tend to urge the valve means in one direction longitudinally in the bore.

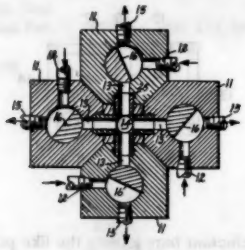
Passage means in one end of the body receive pressure from the flow conduit, and plunger means is mounted in the passage means and is provided with seal means against which the pressure from the flow conduit acts to tend to move the plunger and valve against the force of the resilient means. A vent to atmosphere from the passage means and one end of the longitudinal bore in the valve body is provided so that if the seal means between the plunger and passage leaks, the pressure

from the flow conduit will bypass to atmosphere. Another vent to atmosphere communicates with the other end of the bore. The outlet port means comprises two passages, one of which is adapted to be blocked, depending upon whether the valve is to be used as a high or low pressure controller.

3,746,048
FLUID METERING SYSTEM

Robert C. Harper, Loveland, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed June 20, 1972, Ser. No. 264,604
Int. Cl. F16k *19/00*
U.S. Cl. 137—628 **11 Claims**

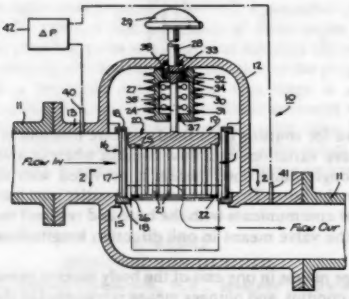


A fluid metering system for assuring a substantially constant supply ratio of a plurality of components of a multi-component mixture during both steady-state and start-up conditions. The system includes a plurality of inlet valves, one for each of the fluids comprising a portion of the mixture, and also includes means for simultaneously actuating each of the inlet valves from a no-flow to a full-flow position. The system further includes means for adjusting the relative angular positions of the several valve members of each of the valves in order to permit variations in initial flow starting times between the valves and thereby compensate for pressure or viscosity differences between the several components of the mixture to maintain a substantially constant ratio of the components.

3,746,049
CONTROL VALVE

Joseph O'Connor, Jr., R.D. No. 1, Goshen, N.Y.

Division of Ser. No. 112,890, Feb. 5, 1971, Pat. No. 3,709,249. This application Sept. 25, 1972, Ser. No. 291,929
Int. Cl. F16k *47/00*
U.S. Cl. 137—802 **1 Claim**

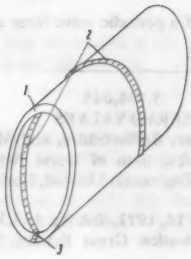


The control valve has a stator which imparts a swirl to the flow of fluid and a rotor which is rotated under the swirl of fluid. Energy is absorbed from the rotor in various ways. In one instance, the rotation of the rotor is subjected to a drag force which is induced in opposition to the force of rotation in order to control the pressure drop in the flow. In another instance, the rotation of the rotor is used to store electrical energy which can be used for other purposes throughout the process system.

3,746,050
MULTI-LAYER PIPE

Kurt Born; Kurt-Walter Neuhoff, both of Mulheim, and Karl Friedrich Wesemann, Homberg, all of Germany, assignors to Mannesmannrohren-Werke GmbH, Dusseldorf, Germany

Filed Sept. 3, 1970, Ser. No. 69,389
Claims priority, application Germany, Sept. 3, 1969, P 19 44 587.5
Int. Cl. F16l *9/14*
U.S. Cl. 138—150 **6 Claims**

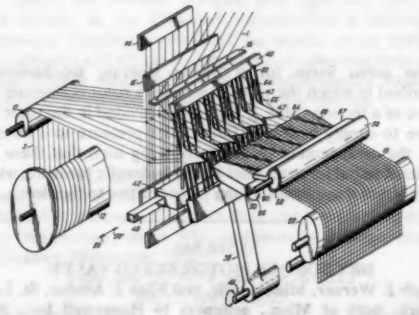


A pipe having a multi-layer, spirally-wound pipe wall for use in very cold temperatures especially for natural gas pipelines or the like in Arctic regions, and a process for manufacturing the same.

3,746,051
MACHINE FOR MAKING A PARTLY WOVEN AND PARTLY KNITTED FABRIC

Josef Mohelnicky, Josef Zmatlik, both of Prague, and Miloslav Jisa, Liberec, all of Czechoslovakia, assignors to Statni Uyzkumny USTAV Textilni, Liberec, Czechoslovakia

Filed Apr. 21, 1972, Ser. No. 246,239
Claims priority, application Czechoslovakia, Apr. 23, 1971, 2981; Jan. 14, 1972, 251; Jan. 19, 1972, 343
Int. Cl. D03d *47/00*
U.S. Cl. 139—11 **29 Claims**



A machine for making a partly woven and partly knitted fabric, having a row of lapping guides mounted on a crossbar for simultaneous angular movement about parallel axes and having radial arms provided with eyelets threaded with weft threads supplied from a weft supply beam and moving along part-circular paths within open warp sheds between an initial position projecting in warp direction, and one, or two opposite, lapping end positions for laying the weft threads into

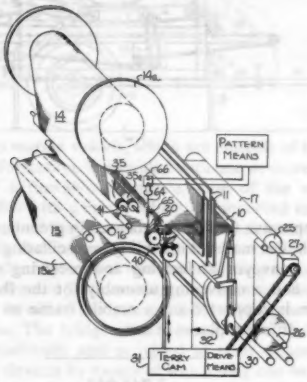
the opened hooks of knitting needles so that knitted stitch wales are formed of sectional weft thread loops between fabric portions woven of warp threads and the sectional weft thread loops.

3,746,052

METHOD AND APPARATUS FOR FEEDING TERRY WARPS IN LOOMS

Douglas P. Burgess, Woodleaf, and Gilmer A. Williams, Kannapolis, both of N.C., assignors to Cannon Mills Company, Kannapolis, N.C.

Filed July 16, 1971, Ser. No. 163,393
Int. Cl. D03d *39/22, 49/06*
U.S. Cl. 139—25 **10 Claims**



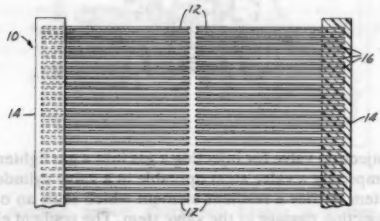
A method and apparatus for positively feeding terry warps during both terry-weaving and non-terry intervals of operation of a terry loom so as to prevent undue stress on the terry warps throughout operation of the loom.

3,746,053

LOOM REED

George W. Crain, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 81,054, Oct. 15, 1970. This application Feb. 2, 1972, Ser. No. 222,835
Int. Cl. D03d *49/62*
U.S. Cl. 139—192 **4 Claims**



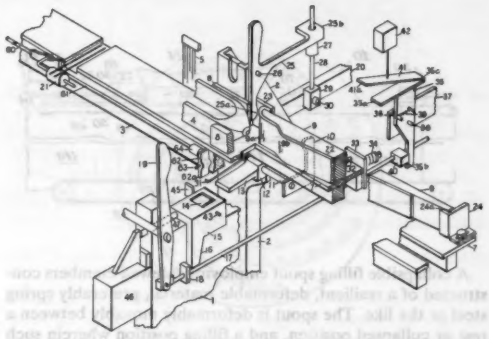
A loom reed is provided with flexible, extrudable thermoplastic adhesive frame members which also serve as dent wire spacing means. Suitable thermoplastic adhesives include ethylene copolymers and polyamides.

3,746,054

SHUTTLE BOXING AND PROTECTION STOPPING MEANS FOR FLY SHUTTLE LOOMS

Edgar P. Turner, Box 70, Scotch Plains, N.J.

Filed Apr. 22, 1971, Ser. No. 136,497
Int. Cl. D03d *51/40, 49/56*
U.S. Cl. 139—341 **7 Claims**



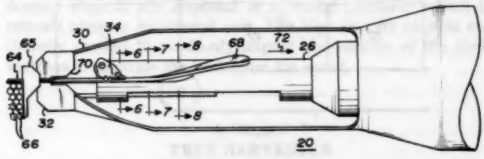
The invention disclosed herein relates in general to fly shuttle looms and specifically to improvement in means for shuttle boxing and protection stopping. With conventional boxing methods, difficulties are often experienced due to failure of the shuttle to consistently stop in precise position within the box. This invention discloses means for overcoming such difficulties by providing reduced impact forces and greater frictional resistance for stopping the shuttle. A novel means is revealed for relieving frictional resistance as the shuttle is ejected from the box. Disclosed is improved shuttle binder design which provides for early shuttle contact and makes possible a novel disclosed method for shockless stopping. Related means for effecting loom stop in event of jammed shuttle or fill thread break is disclosed. Means for positional stopping of the loom on command is disclosed as a desireable related feature.

3,746,055

EJECTING MEANS

Paul Farkas, and Laszlo Hidassy, both of Elizabeth, N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 23, 1972, Ser. No. 265,646
Int. Cl. B21f *9/02*
U.S. Cl. 140—93.2 **15 Claims**

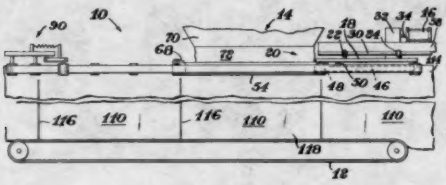


Means for selectively ejecting a resilient elongate article away from the ejecting means comprising a selectively formed deflecting surface providing both longitudinal and axial deformation of the resilient elongate article positionally restrained thereagainst, whereby upon release of the restraining means the deformed portion, in returning to its original state, exerts a composite force against the deflecting surface causing it to be ejected therefrom.

3,746,056
COLLAPSIBLE FILLING SPOUT

Oliver R. Titchenal, Berea, and William A. Armstrong, Brookpark, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed June 7, 1971, Ser. No. 150,274
Int. Cl. B65b 3/16
U.S. Cl. 141—114 7 Claims

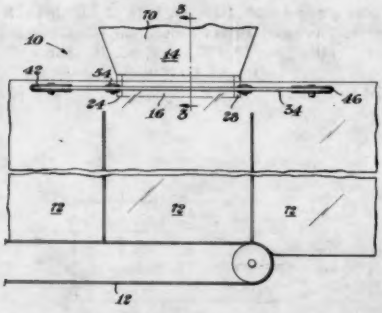


A collapsible filling spout employing sidewall members constructed of a resilient, deformable material, preferably spring steel or the like. The spout is deformably movably between a rest or collapsed position, and a filling position wherein such sidewalls are forcibly flexed or "bowed" outwardly and apart from each other. Such a spout can be used cooperatively with opposed movable belts which pass tautly about the indicated sidewalls, respectively. Spreadable flaps associated with the bags to be filled are gripped firmly underneath the belts and against the sidewalls, so that accompanying outward expansion or deformation of the spout, the bags are opened automatically and held in such position as to efficiently receive the product fill. The use of such a spout minimizes the height required of the bag flaps.

3,746,057
COLLAPSIBLE FILLING SPOUT FOR BAG FILLING MACHINE

Oliver R. Titchenal, Avon, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed June 7, 1971, Ser. No. 150,275
Int. Cl. B65b 3/04
U.S. Cl. 141—114 12 Claims

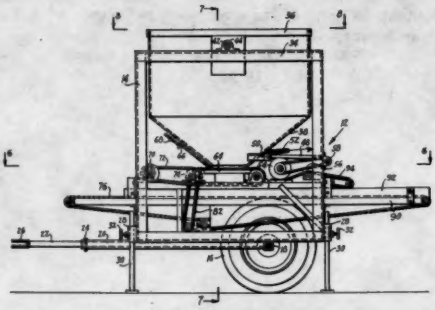


A collapsible filling spout including a sidewall member constructed such as of spring steel or the like so as to be deformably movable toward and away from a preferably stationary sidewall member disposed oppositely thereto. Such a spout is used cooperatively with opposed continuous belts which pass slidingly about the opposed sidewalls thereof, respectively. Spreadable flaps associated with the bags to be filled are gripped firmly between the sidewalls and the belts, respectively, and are thereby opened automatically accompanying outward deformation of the deformable sidewall.

3,746,058
FLAT FILLING MACHINE

Sylvester J. DeBella, P.O. Box 121, Windsor Locks, Conn.

Filed July 15, 1971, Ser. No. 162,810
Int. Cl. B65b 43/52
U.S. Cl. 141—129 1 Claim

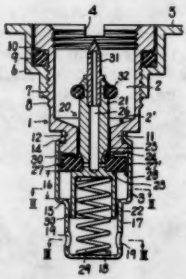


An apparatus for filling flats used in greenhouses with sand, soil or similar material including an oscillating hopper for the sand, a conveyor underlying and receiving sand from the hopper, and a conveying assembly for the flats. The entire structure is supported on a mobile frame so that it can be towed to different places of use.

3,746,059
GAS INJECTION FOR GAS LIGHTERS

Kazuo Mizuguchi, Matudo, Japan, assignor to Mitani Valve Company Limited, Tokyo, Japan

Filed Feb. 26, 1970, Ser. No. 14,492
Claims priority, application Japan, July 29, 1969, 44/59824
Int. Cl. B65b 3/04; F23q 2/52
U.S. Cl. 141—295 4 Claims



An injection valve for injecting a gas into a gas lighter or the like comprising a valve stem operable in a valve cylinder. The valve stem carries a resilient element which seals an opening in an injection passage in the valve stem. The resilient element is of a smaller diameter than the portion of the valve cylinder in which it operates to permit gas to pass between the resilient element and the cylindrical wall when the valve stem is being displaced from a closed to an injection position. However, when the valve stem reaches the injection position, the resilient element is deflected to expose the injection passage in the valve stem to permit liquified gas to pass therethrough.

3,746,060

CONNECTING OF CONDUIT TERMINALS ON TRAVELING MARINE VESSELS

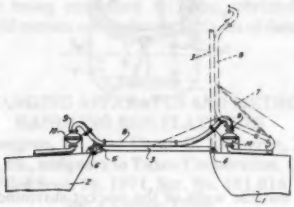
Hans Georg Janssen; Gunter Ecke, and Friedmar Wiese, all of Bremerhaven, Germany, assignors to Aktien-Gesellschaft "Weser", Bremen, Germany

Filed June 24, 1971, Ser. No. 156,291

Claims priority, application Germany, June 26, 1970, P 20 31 672.7

Int. Cl. B65b *3/04*; B67c *3/00*

U.S. Cl. 141—387 **12 Claims**



Each of two marine vessels, which are capable of travelling in line-ahead formation, is provided with one or more conduit terminals for a flowable substance. One of the vessels is further provided with a bridge which is connected to the one vessel at its one end for movement about a horizontal(and/or a vertical)axis so that it can be raised and lowered. The other end of the bridge is provided with a connecting arrangement, preferably a universal joint structure, by means of which it can be connected at will to the other vessel travelling in the wake of the first one. The bridge carries one or more conduits extending longitudinally and provided at their opposite ends with coupling devices by means of which they can be coupled to the conduit terminals on the two vessels so that flowable substance can be transferred from one vessel to the other vessel, and vice versa.

3,746,061

ELECTRIC PENCIL SHARPENER

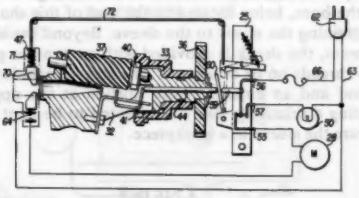
Kenichi Nakazaki, Nagoya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 16, 1971, Ser. No. 181,039

Claims priority, application Japan, Sept. 16, 1970, 45/80465; Sept. 18, 1970, 45/81240; Sept. 18, 1970, 45/81241

Int. Cl. B43l *23/02*

U.S. Cl. 144—28.5 **2 Claims**



An electric pencil sharpener having a cutter holder rotatably mounted on a casing and rotatably supporting at a desired inclination to the axis thereof a cylindrical cutting member having multiple spiral cutting edges integrally formed theron and facing in the direction of insertion of a pencil to be sharpened. Control means are provided for automatically stopping the sharpener when the operation has been completed and for illuminating a lamp to visually indicate that the pencil has been properly sharpened.

3,746,062

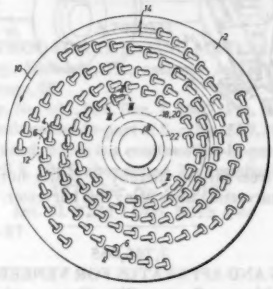
WOOD CHIPPER OR THE LIKE

Kjell Signar Nystrom, and Gosta Ingemar Larsson, both of Pitea, Sweden, assignors to Pitea Maskin Industrie, Nystrom & Larsson AB, Pitea, Sweden

Filed Dec. 13, 1971, Ser. No. 207,285

Int. Cl. B27c *1/00*

U.S. Cl. 144—176 **3 Claims**



The present invention relates to a wood chipper or the like, comprising a plurality of cutting or chipping tools carried by a rotatable tool holder.

3,746,063

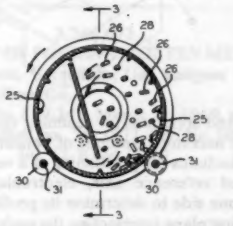
DEBARKING PROCESS AND APPARATUS

Raimond J. Smiltneek, P.O. Box 273, Butler, Wis.

Filed Aug. 31, 1971, Ser. No. 176,615

Int. Cl. B27l *2/00*

U.S. Cl. 144—208 B **18 Claims**



Debarking method and apparatus wherein limb sections to be debarked and a plurality of smaller, substantially higher density objects are disposed in a vaned chamber which is rotated about a horizontal axis. The high density objects are thereby caused to randomly impact the surface of the limb sections to separate the bark from the wood.

3,746,064

TREE HARVESTER

Keith Blackburn, Enumclaw, Wash., assignor to Franklin Equipment Company, Franklin, Va.

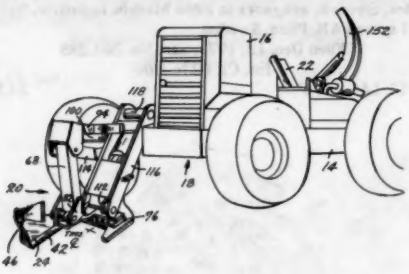
Continuation of Ser. No. 88,331, Nov. 10, 1970, abandoned. This application June 2, 1972, Ser. No. 258,972

Int. Cl. A01g *23/08*

U.S. Cl. 144—309 AC **41 Claims**

A mobile tree harvester including a self-propelled vehicle, tree-shearing means, a pair of vertically spaced, oppositely facing engaging means mounted on the vehicle for catching the severed tree at the commencement of its free fall and for controlling the free fall of the tree until the tree is nearly

horizontal, and lifting means for lifting the tree-shearing means and the engaging means upwardly and rearwardly until



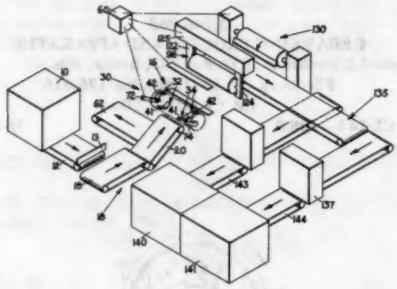
the severed tree carried thereby is nearly horizontal, and a method for harvesting trees using this harvester.

3,746,065

PROCESS AND APPARATUS FOR VENEER CUTTING

Howard C. Mason, Oregon City, Oreg., assignor to H. C. Mason & Associates, Inc., Gladstone, Oreg.

Filed Aug. 5, 1971, Ser. No. 169,297
Int. Cl. B27l *5/00*
U.S. Cl. 144—309 R 4 Claims



A method and apparatus for scanning veneer logs or blocks to obtain the maximum amount of veneer from each block. The method includes the positioning of a veneer block along a predetermined reference axis, electronically scanning the block along one side to determine its profile dimensions with respect to a first plane intersecting the ends of the block, computing the true center line of the block in the first plane, and repositioning the block along that true center line. The block is then rotated by a predetermined angle, such as 90°, and rescanned along a second side to determine its profile dimensions with respect to a second plane intersecting the ends of the block. The true center line of the block in the second plane is then computed and the block is repositioned along the true center line in that plane prior to processing by a rotary veneer lathe. A particular scanning and processing apparatus is disclosed for practicing the steps of the method in processing veneer blocks of different diameters into veneer.

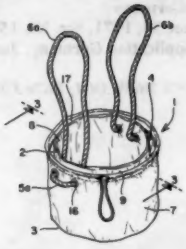
3,746,066

POP-UP POCKET CARRYING BAG

Mary Barbara McIntyre, 440 W. 22nd St., New York, N.Y.

Filed June 18, 1971, Ser. No. 154,329
Int. Cl. A45c *13/26*
U.S. Cl. 150—33 12 Claims

A bag for carrying, typically shaped as a traveler's satchel or a lady's handbag having pop-up pockets for carrying normally extra items as may be desired, such as papers, letters, handkerchiefs, or the like, situated around the main central bag enclosure, the pockets being convertible into merely inside walls of an extended form of the inner container by extending upwardly the outside walls of the pocket surrounding the inner container.

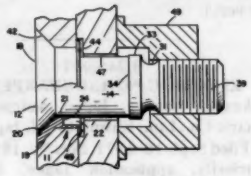


3,746,067

SHEAR-RESISTANT CAPTIVE SCREW

Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Continuation of Ser. No. 59,274, July 29, 1970, abandoned, which is a division of Ser. No. 841,325, July 14, 1969, Pat. No. 3,614,799. This application Dec. 15, 1971, Ser. No. 208,483
Int. Cl. F16b *43/00*; B21d *39/00*
U.S. Cl. 151—69 4 Claims



A captive screw including a sleeve having a bore substantially complementarily receiving a relatively large diameter portion of the shank of a screw inwardly of the screw head, with an annular enlargement on the shank, of greater diameter than the bore, being located at the end of this shank portion and retaining the screw to the sleeve. Beyond the annular enlargement, the shank is provided with an annular groove and rolled threads on its outer end. The sleeve includes a head at one end and an enlarged bore portion at the opposite end providing a relatively thin wall adapted to be bent outwardly to secure the sleeve to a workpiece.

3,746,068

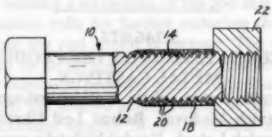
FASTENERS AND SEALANTS USEFUL THEREFOR

Fred W. Deckert, Waunakee, Wis., and Gale W. Matson, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 887,398, Dec. 22, 1969, Continuation-in-part of Ser. No. 638,428, May 15, 1967, abandoned. This application Aug. 27, 1971, Ser. No. 175,458
Int. Cl. F16b *39/00*
U.S. Cl. 151—14.5 3 Claims

Mechanical fasteners and stable pressure-activatable adhesive system therefor based on encapsulated resin, preferably

epoxy and non-volatile curative therefor, preferably an amine such as 1, 3-bis-4-piperidylpropane or imidazole, the capsules



and curative being contained in polar solvent-free binder which can hold system on abutment surfaces of fastener.

3,746,069

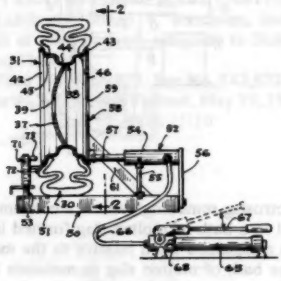
TIRE CHANGING APPARATUS AND METHOD FOR HANDLING RUN FLAT TIRES

Oscar C. Blomgren, Sr., and Oscar C. Blomgren, Jr., both of Lake Bluff, Ill., assignors to Tuxco Corporation, Chicago, Ill.

Filed Sept. 16, 1971, Ser. No. 181,016

Int. Cl. B60c *25/06*

U.S. Cl. 157—1.26 **7 Claims**



Tire changing apparatus and method for mounting and demounting run flat tires onto wheels, including a tire stand having a hydraulic ram operating a disc for engaging a wheel and to coact with a bead braking shoe, and means for anchoring the tire and wheel to the stand when applying forces to move the bead of the tire over the rim of the wheel.

3,746,070

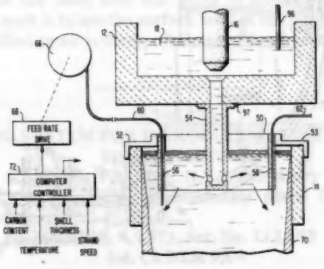
METHOD FOR IMPROVING CONTINUOUSLY CAST STRANDS

William P. Hill, Allison Park, Pa., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed June 25, 1971, Ser. No. 156,818

Int. Cl. B22d *11/10*

U.S. Cl. 164—57 **9 Claims**



Method of improving the structure of continuously cast strand by separating undesirable hot metal inclusions at locations spaced from cooling wall surfaces of a continuous casting mold and removing at least a portion of the superheat of molten metal internally of the shape being cast. Apparatus is provided for delivering hot metal subsurface to molten metal level within a continuous casting mold with a component of motion opposite to the direction of casting, initially confining such metal,and changing its direction of movement for separating undesirable inclusions. Apparatus is provided for introducing solid metal below the slag and molten metal surface into the high temperature zone.

3,746,071

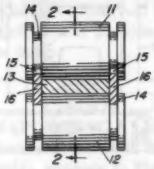
METHOD FOR TREATING MATERIALS

John A. Schey, Hinsdale, Ill., assignor to IIT Research Institute, Chicago, Ill.

Division of Ser. No. 691,109, Dec. 7, 1967, Pat. No. 3,561,240, which is a continuation-in-part of Ser. No. 587,358, Sept. 16, 1966, abandoned, which is a continuation-in-part of Ser. No. 444,637, April 1, 1965, abandoned. This application Aug. 28, 1970, Ser. No. 67,910

Int. Cl. B22d *11/06*; B21b *1/44*

U.S. Cl. 164—87 **3 Claims**



A method and apparatus is disclosed for forming materials into desired shapes by rolling or casting. The rolled shapes may be of constant or irregular cross section. The apparatus includes lateral restraint members that move with the workpiece to prevent edge cracking in rolling or provide a moving wall die in casting.

3,746,072

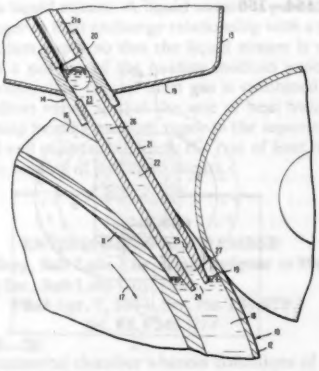
METHOD OF POURING MOLTEN METAL

Billy Joe Richardson, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 809,241, March 21, 1969, abandoned. This application Jan. 20, 1971, Ser. No. 107,917

Int. Cl. B22d *11/10*

U.S. Cl. 164—87 **3 Claims**



A molten metal pouring method and apparatus for use with a continuous metal casting machine wherein molten metal is poured from a pouring vessel through a pouring spout into an arcuate mold formed by the peripheral groove of a casting

wheel and a continuous band surrounding a portion of the casting wheel. The pouring spout is formed with a passage having a reduced diameter at its outlet opening, and the molten metal is initially flowed at a high flow rate to purge substantially all of the air from the internal passage of the pouring spout, and pool the metal in the larger diameter portion of the pouring spout. The absence of air in the pouring spout is effective to reduce voids and blisters in the cast bar and the build up of solidified metal in the internal passage of the pouring spout.

3,746,073

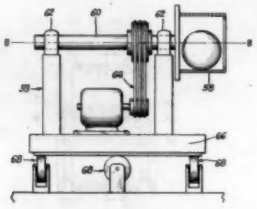
METHOD OF CASTING HOLLOW METAL BALLS

James E. Schmuck, Tempe, Ariz., and Walter C. Troy, National City, Calif., assignors to AMSTED Industries, Incorporated, Chicago, Ill.

Filed Dec. 1, 1971, Ser. No. 203,593

Int. Cl. B22d *13/06*

U.S. Cl. 164—116 **3 Claims**



A cast steel ball having a centrally located spherical void and an uninterrupted outer surface is provided for use in mills used to pulverize material. The ball is produced by a centrifugal casting method in which the axis of rotation of the ball is constantly changed during solidification of the molten steel. A mold arrangement made of a chill material and having no risers is provided in order that the outer surface of the ball is uninterrupted and of substantially the same grannular structure throughout.

3,746,074

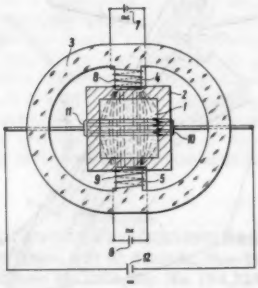
APPARATUS FOR REGULATING THE SOLIDIFICATION OF THE LIQUID CORE IN A CONTINUOUS CASTING

Hans-Georg Baumann, Duisburg, Germany, assignor to Demag AG, Duisburg, Germany

Filed May 26, 1971, Ser. No. 146,956

Int. Cl. B22d *27/02*, *11/12*

U.S. Cl. 164—250 **6 Claims**



To regulate the pressure exerted by the liquid core within a continuous casting as it solidifies, a magnetic field is established about the casting or strand in the region in which it contains a liquid core. Further, to increase or decrease the effect of the magnetic field, a d.c. field is established about the strand adjacent the magnetic field with the axis of its electrodes positioned perpendicularly to the axis of the poles of the magnetic field.

3,746,075

ELECTROSLAG SYSTEM FOR THE PRODUCTION OF METAL CASTINGS

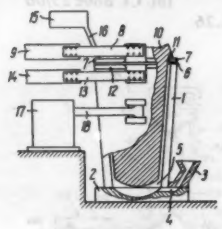
Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Boris Izrailevich Medovar, Bulvar Lesi Ukrainki 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt, 87, kv. 14, and Vitaly Mikhailovich Bagini, ulitsa Semashke 10, kv. 54/3, all of Kiev, U.S.S.R.

Division of Ser. No. 707,088, Feb. 21, 1968. This application June 29, 1970, Ser. No. 60,168

Claims priority, application U.S.S.R., Feb. 25, 1967, 1,136,880; Feb. 25, 1967, 1,136,881; Apr. 20, 1967, 1,150,103; July 17, 1967, 1,173,639

Int. Cl. B22d *27/02*

U.S. Cl. 164—252 **33 Claims**



In an electroslag remelting system, a consumable electrode is immersed in a bath of molten slag formed in a mold. The electrode is maintained fixed relative to the mold and slag is added to the bath of molten slag to maintain the process of melting of the consumable electrode as the electrode melts.

3,746,076

DEVICE FOR THE CONTINUOUS CASTING AND SUBSEQUENT ROLLING OF A METAL FROM ITS CASTING HEAT IN SHORT STEPS

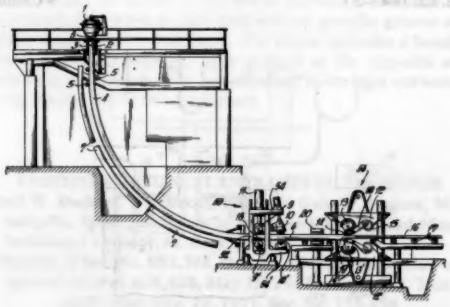
Hans G. Baumann, 41 Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Division of Ser. No. 886,518, Dec. 19, 1969. This application Sept. 14, 1971, Ser. No. 180,363

Claims priority, application Germany, Dec. 24, 1968, P 18 16 849.5

Int. Cl. B22d *11/12*

U.S. Cl. 164—270 **6 Claims**



A method and apparatus for continuously casting metal in particular, steel rods, includes a continuous casting mold in which the rod is continuously cast and cooled to solidification

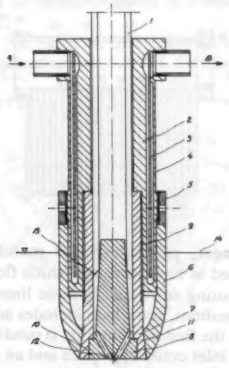
as it is passed through the mold and moved through a transport path. The rod which is cast is subjected to a first set of up setting rolls and straightening rolls for reducing its cross section and for causing a stretching of the rod and a second set of high deformation rolls for further reducing the cross section and stretching the rod which is formed. The construction is characterized by an arrangement of the first acting sets of rollers at a first station to produce such a rod reduction and a rod stretching that the second acting rollers at the second station attain a maximum degree of deformation and at a faster passage rate of the rod which is cast and which therefore also requires a lower rolling force. The apparatus includes a roll stand for deforming the casting at a high reduction per pass which is preceeded by a roll stand having a roll gap which in the set in dependence upon the ratio of the casting cross section at the mold and the smallest possible rolling gap of the high deformation rollers. The construction is such that the casting cross section of the mold has a side ratio greater than one and the upsetting gap of the first roller set of approximately one and that of the high deformation stand of one or less than one. The side ratio is the relationship of the side lengths with one another.

3,746,077

APPARATUS FOR UPWARD CASTING

Timo J. J. Lohikoski; Mauri V. Rantanen, and Heimo H. Hocksell, all of Pori, Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed May 12, 1971, Ser. No. 142,532
Claims priority, application Finland, May 19, 1970, 1403
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **5 Claims**



Profiled metal products are continuously cast by maintaining a nozzle having an upper cooling zone immersed into a melt to receive and cool the melt. The nozzle is immersed so deep into the melt that the point of solidification of the received melt is below the surface level of the outside melt and the solidified smelt is then pulled upwards while being further cooled.

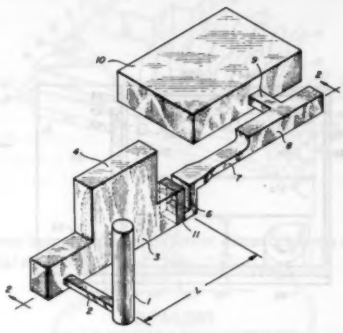
3,746,078

GATING SYSTEM FOR INTRODUCING ADDITIVES TO MOLTEN METAL

William H. Moore, Purchase, N.Y., and Harry H. Kessler, Ladue, Mo., assignors to Meehanite Metal Corporation, White Plains, N.Y.

Filed Feb. 4, 1971, Ser. No. 112,553
Int. Cl. B22c *9/08*
U.S. Cl. 164—363 **7 Claims**

A gating system which includes a treating basin for treating molten metal such as cast iron with additives such as a nodularizing agent. Molten metal is introduced into the basin by way of a passage such as a downsprue and from the basin to a mold cavity by way of a passage such as runner bars and ingates. A restriction (dam gate) is provided in the last mentioned passage and controls the dwell time of molten metal in the treating basin. An additive reservoir is connected with the treating basin and a closure is provided which temporarily restrains flow from the basin.

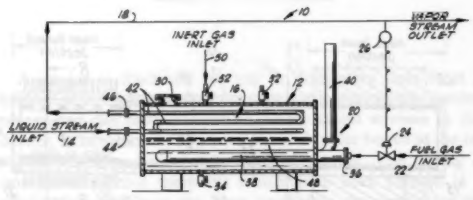


3,746,079

METHOD OF VAPORIZING A LIQUID STREAM

Edwin M. Arenson, deceased, late of El Reno, Okla. (by Gloria W. Arenson, executrix), assignor to Black, Sivalls & Bryson, Inc., Oklahoma City, Okla.

Filed Jan. 21, 1972, Ser. No. 219,655
Int. Cl. F28d *15/00*
U.S. Cl. 165—1 **12 Claims**



The present invention relates to an improved method of vaporizing a liquid stream. A liquid stream is passed within a heat exchanger in heat exchange relationship with a stream of heating medium vapor so that the liquid stream is vaporized and at least a portion of the heating medium vapor is condensed. A controlled rate of inert gas is combined with the heating medium vapor so that the rate of heat transfer from the condensing heating medium vapor to the vaporizing liquid is restricted and maintained below the rate of heat transfer at which vapor-binding of the liquid occurs.

3,746,080

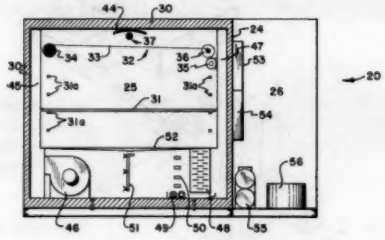
ENVIRONMENTAL CHAMBER

Roy E. Mallory, Salt Lake City, Utah, assignor to Mallory Engineering Inc., Salt Lake City, Utah

Filed Apr. 7, 1971, Ser. No. 131,879
Int. Cl. F24f *3/14*
U.S. Cl. 165—20 **9 Claims**

An environmental chamber wherein conditions of temperature, humidity, and daylight are simulated to most nearly approximate conditions found in nature. The chamber uses an Xenon lamp as a light source to closely simulate natural sunlight. Within the chamber, light from the Xenon lamp is changeably filtered so as to produce light conditions that

nearly approximate the varying sun conditions which exist throughout a typical normal day at a particular location. Temperature and humidity are controlled by air conditioning and



heating systems that are programmed to produce atmospheric conditions within the chamber in simulation of actual environmental conditions.

3,746,081

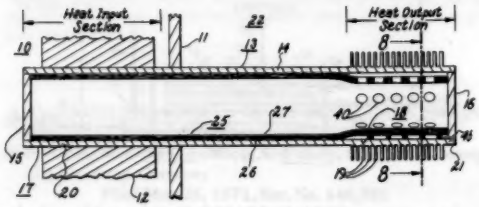
HEAT TRANSFER DEVICE

James C. Corman, Scotia, and Gunnar E. Walmet, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 16, 1971, Ser. No. 124,805

Int. Cl. F28d 15/00

U.S. Cl. 165—32 **2 Claims**



In a heat pipe the portion of the wicking material which receives the liquid condensed at the condenser surface at the heat output end of the heat pipe is provided with a plurality of large openings extending from the surface adjacent the condenser surface to the opposing surface thereof to avoid condensate accumulation adjacent the condensation surface. Such accumulation blocks access of the condensation surface to vapor and hence increases the thermal impedance of the heat output end of the heat pipe.

3,746,082

HEAT EXCHANGER APPARATUS AND METHOD

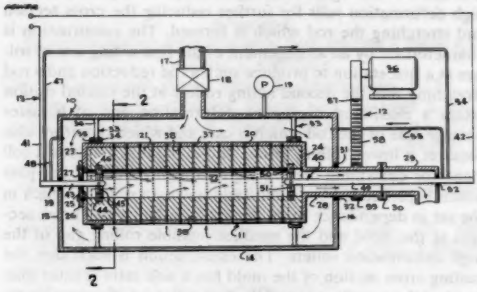
Jerry Grey, 61 Adams Drive, Princeton, N.J.

Filed Apr. 15, 1968, Ser. No. 721,376

Int. Cl. F25b 29/00

U.S. Cl. 165—61 **23 Claims**

A heat exchanger generally including a mass of fusible material, means for melting at least a portion of the mass of material, means for rotating the mass of material to maintain the physical integrity of the molten portion of the mass of material by centrifugal force whereby an axial passageway is formed therein, means for injecting a fluid through the rotating molten portion of the mass of material and means for in-



jecting a working fluid through the axial passageway in the rotating molten portion of the mass of material.

3,746,083

HEAT-EXCHANGER

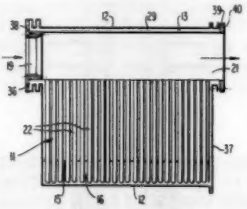
Eberhard Tiefenbacher, Ludwigsburg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 20, 1970, Ser. No. 91,364

Claims priority, application Germany, Nov. 21, 1969, P 19 58 507.0

Int. Cl. F28f 7/00

U.S. Cl. 165—83 **33 Claims**



A heat-exchanger, particularly for mobile gas turbines, which is composed of lines, through which flows a first medium, and of a housing surrounding these lines through which flows a second medium, and which includes additionally a collecting space for the first medium that is subdivided by a partition wall into an inlet collecting space and an outlet collecting space, the two collecting spaces being connected with one or several chambers by way of the lines; the housing, in addition to surrounding the lines, further surrounds the collecting tank and is secured exclusively at the end faces thereof; the chambers are formed by the housing together with an apertured plate supported in rails.

3,746,084

HEAT-EXCHANGER COMPRISING A PLURALITY OF HELICALLY WOUND PIPE ELEMENTS

John David Bertil Ostbo, Byvagen 38, S-1515, 52 Sodertalje, Sweden

Filed Apr. 1, 1971, Ser. No. 130,244

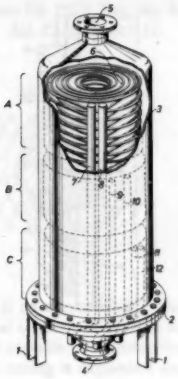
Claims priority, application Sweden, Apr. 16, 1970, 5264/70

Int. Cl. F28d 7/10

U.S. Cl. 165—163 **1 Claim**

In a heat-exchanger comprising a plurality of helically wound pipe elements stacked on top of each other and having their ends connected to risers all the risers are located inside the jacket of the heat-exchanger but radially outside the stack

and within the same half of the circumference thereof. The design makes all the connections of the elements readily accessible and permits convenient demounting and remounting



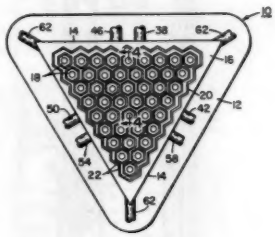
of individual elements by lateral extraction of a faulty element from the stack and re-insertion of it upon repair work. The stack is preferably composed by two or more sections any such section being provided with its own risers.

3,746,085

METHOD AND APPARATUS FOR FORMING MULTI-BORE TUBING

Carl D. Andrysiak, Painted Post, and Richmond W. Wilson, Cornig, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 765,494, Oct. 7, 1968, Pat. No. 3,607,185.
This application Feb. 5, 1971, Ser. No. 112,960
Int. Cl. F28f *1/00*
U.S. Cl. 165—172 **14 Claims**



Thin-walled multi-bore tubing having from about 10 to over 300 individual longitudinal bores is unitarily formed by drawing molten glass downwardly through a multiple bell orifice structure so as to provide a multiplicity of small diameter holes or bores having thin-walled partitions therebetween which produce an open frontal area of up to about 80 percent of the cross-sectional area of such tubing with a hole density of over 200 holes per square inch.

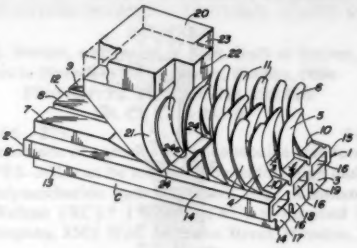
3,746,086

HEAT EXCHANGERS

Stephen F. Pasternak, Park Ridge, Ill., assignor to Peerless of America, Incorporated, Chicago, Ill.

Filed Aug. 27, 1971, Ser. No. 175,675
Int. Cl. F28f *1/20*
U.S. Cl. 165—181 **11 Claims**

A heat exchanger embodying an elongated tubular member with integral fins, in the form of spines, projecting outwardly therefrom in rows, with the transversely adjacent fins in adjacent rows being disposed different distances from an end of the tubular member.

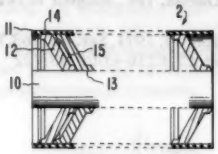


3,746,087

HEAT DISSIPATION DEVICE

Gordon R. Lavering, Belmont, and Charles M. Eallonardo, Supertino, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Apr. 19, 1971, Ser. No. 135,472
Int. Cl. F28f *7/00*
U.S. Cl. 165—185 **13 Claims**



A device is disclosed for use in dissipating heat from a heated object when restrictions on expansion of the heated object and the heat dissipation device cause stresses in the device, in any containing structures and in the bonds at the interfaces of the device with other structures. The device is comprised of thin members which have been formed in a shape distorted from the lines normal to the surface of attachment of the members to the object. The members surround and are in thermal contact with the heated object. As the members and object expand and contract during temperature cycling, the members deform, allowing the heated object to move relative to surrounding structures, thus relieving stress. When such movement is constrained, the members are thin enough to relieve stress by deformation into the space between the members. A preferred embodiment of this device uses members which are shaped generally like a hollow truncated cone.

3,746,088

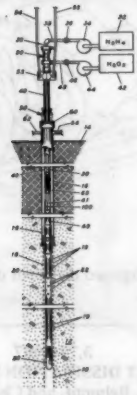
APPARATUS FOR USE IN WELLS

Charles A. Haskin, and Ralph S. Millhone, both of Brea, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sept. 7, 1971, Ser. No. 177,933
Int. Cl. E21b *43/24*
U.S. Cl. 166—59 **5 Claims**

Apparatus for use in mixing reactive fluids in a well to supply heat to the well and including tubing strings providing two flow paths from the earth's surface down the well to a reaction chamber. The reaction chamber has a closed lower end and an upper end connected to the tubing strings. The flow paths extend down to the lower portion of the reaction

chamber to provide flow paths for reactive fluids down the chamber to the lower end thereof. Exhaust port means are formed near the upper end of the chamber to permit reaction products to be expelled from the chamber into the well.

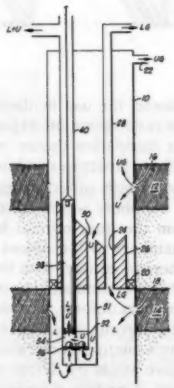


3,746,089

APPARATUS FOR PRODUCING MULTIPLE ZONE OIL AND GAS WELLS

Naylan N. Vencil, Odessa, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 19, 1971, Ser. No. 163,795
Int. Cl. E21b *43/00, 33/122*
U.S. Cl. 166—106 **4 Claims**



Two or more oil and gas zones are produced by allowing production from at least one zone to drain down to a common chamber where production from the zones is comingled and lifted to the earth's surface. A separate gas vent is provided for each zone to the earth's surface.

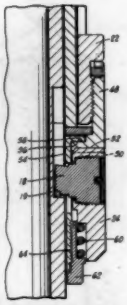
3,746,090

LATCH OR RETRIEVABLE WELL PACKER

Norman W. Read, and Ernest P. Fisher, Jr., both of Dallas County, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed June 21, 1971, Ser. No. 155,032
Int. Cl. E21b *23/06, 33/129*
U.S. Cl. 166—134 **14 Claims**

A selectively engageable clutch connecting the mandrel to the friction device allows residual torque in the tubing to rotate through a well tool, such torque having resulted from greatly exaggerated movements of the tubing at the surface of the well bore used in activating a latch mechanism in a packer at considerable depth in the well bore.

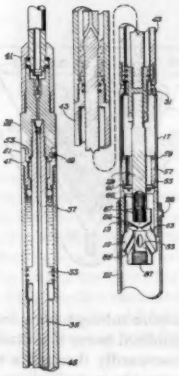


3,746,091

CONDUIT LINER FOR WELLBORE

Harrold D. Owen, 3921 Sarita Ct.; Wayne O. Rosenthal, 7809 Rockdale Rd., and James Douglas Young, all of Fort Worth, Tex.

Continuation-in-part of Ser. No. 878,108, Nov. 19, 1969, abandoned. This application July 26, 1971, Ser. No. 166,032
Int. Cl. E21b *43/10*
U.S. Cl. 166—207 **21 Claims**



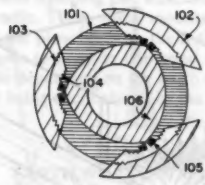
A liner for emplacement in a conduit in a well penetrating subterranean formations characterized by an annular body portion having substantially cylindrical interior and exterior surfaces that are at least partially coextensive and having an outside diameter less than the inside diameter of the conduit; the liner having a metallurgical composition and dimensions for being expanded to conformingly engage the conduit with a tight frictional engagement. The liner is adapted for use with a wireline setting tool without the necessity for a separate anchor or support. Also disclosed are the method of emplacing the liner in the conduit, specific metallurgical compositions, and specific embodiments and combinations.

3,746,092

MEANS FOR STABILIZING WELLBORES

Karl M. Land, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed June 18, 1971, Ser. No. 154,540
Int. Cl. E21b 43/10
U.S. Cl. 166—207 7 Claims



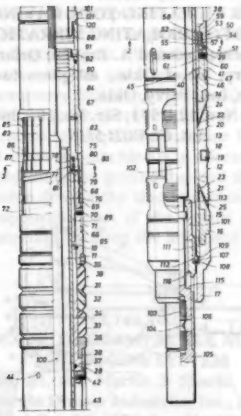
Disclosed herein is an expandable casing comprised of inside and outside axial sections of casings which fasten to form a sealed casing joint capable of withstanding pressure and formation loads as the casing is expanded and locked into position. The expandable casing stabilizes wellbores, preventing deformation, fracturing or fluid communication between fluids conducted within the wellbore and formations isolated through use of the casing. The casing sections are attached to an inflatable bladder element which affords placement through smaller diameter wellbores and orderly expansion of the sections in the wellbore adjacent to the formation to be stabilized or protected.

3,746,093

RELEASABLE LOCKING SYSTEM FOR A WELL TOOL

Albert A. Mullins, Richmond, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed May 26, 1972, Ser. No. 257,367
Int. Cl. E21b 23/06, 33/129
U.S. Cl. 166—217 12 Claims



In accordance with an illustrative embodiment of the present invention, a new and improved locking system for locking and releasing parts of a well tool in a well bore is incorporated between members that are movable longitudinally relative to one another. The locking system includes a lock ring having gripping engagement with one member, and cam means that causes the lock ring to grip the member when in one position and movable to another position that enables the lock ring to pass longitudinally therethrough. After passage through the cam means, the lock ring is received within a recess on the other member so that the said other member can move freely along the one member upon disengagement of the cam means.

3,746,094

POLYALKENEOXIDE AND POLYSACCHARIDE GUM DERIVATIVES MOBILITY CONTROL AGENT AND PROCESS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 12, 1971, Ser. No. 133,060
Int. Cl. E21b 43/16
U.S. Cl. 166—275 5 Claims

Flow resistance of aqueous polyalkeneoxide solutions, e.g., Polyox WRS-301, can be increased by adding high molecular weight polysaccharide gum derivative, e.g., Xanthan gums such as Kelzan (XC).* (*Kelzan (XC) is supplied by the Kelco Company, 3501 West Alabama Street, Houston, Texas, 77027.)

3,746,095

ALKYL BIS(HYDROXYPHENYL)ALKANOATES AND ALDEHYDE CONDENSATION PRODUCTS THEREOF

Derry D. Sparlin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 87,331, Nov. 5, 1970. This application Sept. 21, 1971, Ser. No. 182,513
Int. Cl. E21b 33/13
U.S. Cl. 166—295 4 Claims

Bis(hydroxyphenyl)alkanoic acids and high molecular weight alkanols are converted to novel alkyl bis(hydroxyphenyl)alkanoates which are condensed with alkanals to form novel condensation products which are useful as molding resins, coatings, adhesives, consolidation agents, and the like. Such condensation products can be employed to consolidate an unconsolidated subterranean formation.

3,746,096

SURFACTANT COMPOSITION

Harry T. Zika, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 504,050, Oct. 23, 1965, abandoned. This application Oct. 31, 1969, Ser. No. 872,951
Int. Cl. E21b 21/04
U.S. Cl. 166—311 3 Claims

Secondary-n-undecanol ethoxysulfates containing from about 2.5 to about 6 ethyleneoxy units are excellent all-purpose foaming agents for air or gas drilling of wells. These compounds, in addition to their foaming ability, are fully biodegradable.

3,746,097

SUBSURFACE BLOWOUT PREVENTION

James D. Mott, Houston, Tex., assignor to Michael P. Breston, Houston, Tex., a part interest

Filed Oct. 16, 1970, Ser. No. 81,327
Int. Cl. E21b 23/00, 33/12
U.S. Cl. 166—315 41 Claims

In a tool and method for automatic subsurface closure of a well to prevent blowout conditions, the tool including a movable sealing means and a fluid-flow control means positioned above the sealing means, the movable sealing means being adapted to shut in the well in response to a subsurface pressure condition, the fluid flow control means automatically providing an opening for circulating drilling fluid above the sealed off area, the improvement comprising: an elongated mandrel adapted to allow the movement of the drill string after the sealing means effectively shuts in the well, a pressure

sampling valve to monitor the external pressure of the fluid below the activated sealing means, and a mechanical release

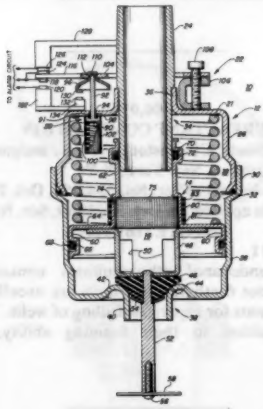
mechanism adapted to operate the fluid flow control means thereby mechanically contracting the sealing means.

3,746,098

AUTOMATIC ON-OFF SPRINKLER HEAD SYSTEM

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Filed July 23, 1971, Ser. No. 165,672
Int. Cl. A62c *37/06*
U.S. Cl. 169—37 **30 Claims**



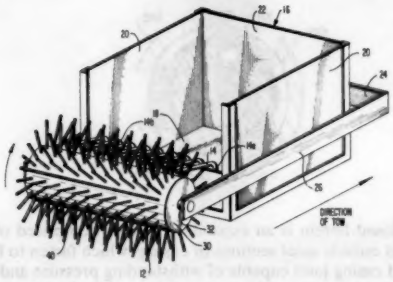
An automatic on-off fire quenching sprinkler system comprising an inlet means and one or more branch lines issuing therefrom having one or more automatic on-off sprinkler heads including a housing, a movable partition sealingly engaging the housing for dividing the housing into two chambers: a primary chamber and a control chamber, the housing including an inlet port in the primary chamber adapted for connection with a source of fire quenching fluid, and an outlet port in the primary chamber for dispensing fire quenching fluid, a control valve in the control chamber, a heat responsive device for opening the control valve to vent the control chamber above a predetermined temperature and close said control valve below that temperature, a valve element connected with the partition for closing the outlet port, biasing means for producing a force on the partition to urge the valve element to close the outlet port, and a passage interconnecting the primary and control chambers for enabling equalization of pressure therein.

3,746,099

METHOD AND APPARATUS FOR PICKING UP LITTER

John Dennis Black, 3107 Bell Drive, Augusta, Ga.

Filed Aug. 20, 1971, Ser. No. 173,609
Int. Cl. A01b *43/00*
U.S. Cl. 171—63 **4 Claims**



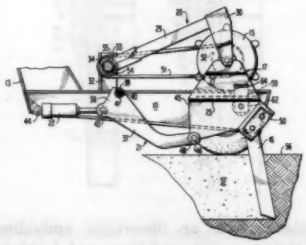
Method and apparatus for picking up litter wherein a drum having a plurality of substantially rigid metallic tines projecting radially therefrom is rolled over litter to pick up the same on the ends of the tines and then to carry it into engagement with a plurality of stripper members which remove the litter and guide the same into a receptacle positioned forwardly of the tine and drum assembly. The apparatus may be connected to the rear of a vehicle for movement over the litter by means of a tow bar fixed to the receptacle; the tow bar including side members projecting rearwardly from the receptacle for journaling the drum in the extremities thereof. The stripper members are arcuate having their forward ends suitably fixed to a portion of the receptacle while extending rearwardly from the receptacle between adjacent rows of tines below the extremities thereof.

3,746,100

MOUNTING FOR VIBRATING TOOL HAVING DAMPING MEANS FOR ISOLATING VIBRATIONS

Larry E. Hall, Perry; Leonard A. Branen, Orlando, and Glen F. Moore, Perry, all of Okla., assignors to The Charles Machine Works, Inc., Perry, Okla.

Filed Nov. 12, 1971, Ser. No. 198,364
Int. Cl. E02f *5/18*
U.S. Cl. 172—40 **30 Claims**



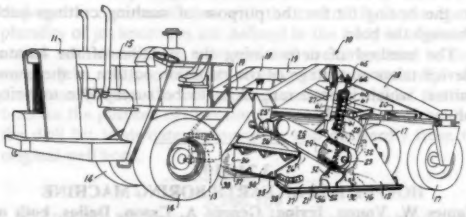
A plow blade perferrably designed for feeding or pulling a utility service wire or tubing into an earth opening formed by the plow blade while vibrating, may constitute the working member of a vibratory machine which is preferrably mounted on a four wheel supported frame, with the blade attached to a cradle having a floor portion mounting a vibrator. Upper and lower mounting arms are pivotally attached between the frame and the cradle. The cradle is movable between a working position and a retracted position spaced from the working position along a curvilinear path defined by the pivoting upper

and lower arms. Movement between the two positions is accomplished by means of a hydraulic motor attached between the frame and the lower arm. The pivotal mountings for the two arms each include means such as sleeves for damping vibrations between the arms and the frame. When the cradle is in the working position it is supported by and transfers the plowing load, generated by the vibrating blade engaging the soil during vibratory plowing, to a pair of shear mounts each having a resilient damping pad attached to the frame and engaging the cradle. These shear mounts transfer the load encountered by the plow blade to the front wheels of the wheel supported frame to provide improved driving characteristics for the vehicle depending on the earth or soil conditions, i.e., heavy or light being encountered by the vibrating plow blade.

3,746,101
EARTH WORKING MACHINE

Harry H. Takata, Minneapolis, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Feb. 1, 1971, Ser. No. 111,283
Int. Cl. A01b *33/00*
U.S. Cl. 172—112 **9 Claims**



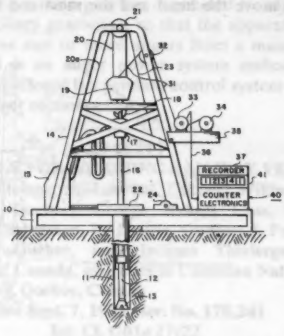
A soil stabilizing and conditioning machine with power driven traction wheels by which the machine is propelled forwardly while a horizontally disposed soil cutting and pulverizing rotor operating under a hood, and rotating in the direction to have its tines enter the fresh soil with a forward up-cutting action, resists forward propulsion of the machine and also mounds up the soil cut from the ground in front of the advancing rotor; an adjustable gate which forms the front wall of the hood and coacts with the uncut ground in front of the rotor precludes an excessive build-up of loose soil in front of the rotor, so that the presence thereof does not seriously increase the power required to propel the machine forward and drive the rotor, and when the machine is in operation and the hood is being dragged along the ground the load thus imposed upon the power source driving the traction wheels is substantially reduced by supporting part of the weight of the hood by a levitating connection between the hood and the chassis of the machine.

3,746,102
AUTOMATIC DRILLING BREAK ALARM AND SHUTDOWN SYSTEM

Phil H. Griffin, III, and Martin J. Sharki, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 22, 1971, Ser. No. 191,693
Int. Cl. E21b *19/08*
U.S. Cl. 173—4 **7 Claims**

The rate of penetration of a drill bit and associated drill string used in drilling oil and gas wells is monitored and the resulting output signal activates an alarm whenever the rate of penetration exceeds a predetermined level. The depth of penetration is also monitored during the time that the rate of penetration is excessive and when the depth interval during such time exceeds a given number of feet, a second alarm is sounded. When the depth interval during the excessive rate of penetration is greater than a second predetermined number of feet, a signal is sent to the drawworks which takes the weight off the bit. Means are also provided for resetting the depth counting mechanisms whenever either of the depth interval circuits have counted to less than their predetermined capaci-

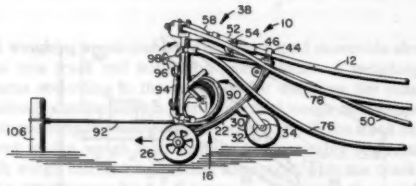


ty whenever the rate of penetration has diminished to a point which is less than the predetermined excessive level. In an alternative embodiment, predetermined time intervals are used instead of depth intervals.

3,746,103
EARTH BORING APPARATUS

Jack Dean Lovig, 1417 Mariners Drive, Newport Beach, Calif.

Filed Sept. 24, 1971, Ser. No. 183,400
Int. Cl. E21c *5/06, 11/02*
U.S. Cl. 173—24 **5 Claims**



An earth boring apparatus having a hollow bore pipe and bit for the introduction of water through an axial passage thereof to loosen the strata through which said boring apparatus is boring and having a first air motor for driving said boring tool. The boring apparatus has a wheeled carriage with a support for a second air motor driven winch with a cable extending therefrom for pulling said carriage backwardly or forwardly along the length of the bore. The winch motor can be controlled by a valve which delivers air under pressure thereto so that the carriage can be moved backwardly or forwardly at a selected speed in response to the amount of air which is delivered through said valve.

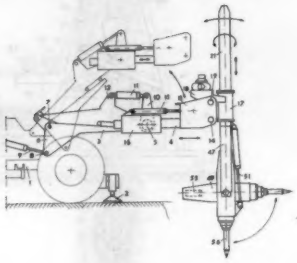
3,746,104
ROCK WORKING IMPLEMENT CARRIER

Ian Arthur McIntosh; Norman John Bowers; Brian Alfred Bowers, and Bruce Robert Miles, all of Sydney, Australia, assignors to Air Advantage (Australia) Pty. Limited, New South Wales, Australia

Filed Sept. 9, 1971, Ser. No. 178,918
Claims priority, application Australia, Sept. 15, 1970, 2540/70
Int. Cl. E21c *11/02*
U.S. Cl. 173—43 **4 Claims**

A rock working implement carrier comprising a boom adapted to be pivotally mounted by one end on a mobile

machine, power means to move the boom relative to the machine and hold it in a selected position, a head pivotally mounted on the other end of the boom, a socket on the head, a mast vertically slidable and rotatable in the socket, power means to move the head and the mast and hold the several



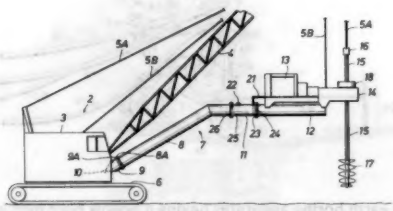
parts in selected positions, a yoke mounted on the bottom of the mast, an implement carrier swingably mounted in the yoke and means to move and hold the carrier in a selected position, an implement cradle slidably mounted in and projecting from the carrier and a pneumatic-cylinder plunger unit to actuate the cradle.

3,746,105

ARM EXTENSION FOR DRILLING FOUNDATION HOLES

Glyen D. Farmer, and J. C. Owens, both of Houston, Tex., assignors to Farmer Foundation Company, Houston, Tex.

Filed Dec. 15, 1971, Ser. No. 208,215
Int. Cl. E21b *3/04*
U.S. Cl. 173—44 **14 Claims**



An improved arm extension is provided which is mounted at one end to a carrier or the like, and which is capable of supporting an auger or other boring device at the other end. The arm extension is composed of one or more tubular sections coupled together to reach between the carrier and the site of the borehole, and preferably has a dog-leg configuration to elevate the engine mounted on its outer end to a suitable height above the borehole site.

3,746,106

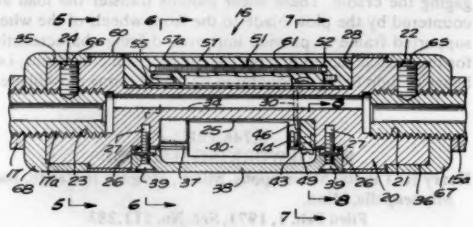
BORING BIT LOCATOR

Lester E. McCullough, Glendale, and Duane A. Ladine, Northridge, both of Calif., assignors to The Goldak Co., Inc., Glendale, Calif.

Division of Ser. No. 52,474, July 6, 1970, and a continuation-in-part of Ser. No. 52,474, July 6, 1970. This application Dec. 27, 1971, Ser. No. 212,134
Int. Cl. E21b *47/02*
U.S. Cl. 175—45 **16 Claims**

A bore pipe is rotatably driven to dirve a horizontal bore below the earth's surface, and radio energy transmitted from a locator device is monitored on the ground surface by means of a radio receiver tuned to the same frequency. A boring bit locator is rigidly attached between the bore pipe and a boring bit, and carries a small battery powered transmitter. A single operator working on the surface of the ground with a single radio receiver is able to monitor the progress and location of the boring bit.

The boring bit locator has a water passageway which permits a stream of water delivered through the bore pipe to flow



to the boring bit for the purpose of washing cuttings back through the hole.

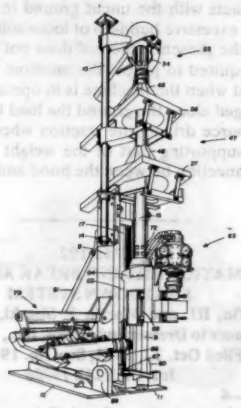
The method of determining the position of the locator device takes advantage of the radiation pattern of the transmitter, which is so arranged as to be susceptible to being precisely measured.

3,746,107

HOPPER FOR AN EARTH BORING MACHINE

James W. Young, Irving; George A. Cason, Dallas, both of Tex., and Ernest O. Kunkel, Nevada, Mo., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 7,923, Feb. 2, 1970. This application Oct. 29, 1971, Ser. No. 190,446
Int. Cl. E21c *7/00*
U.S. Cl. 175—207 **1 Claim**



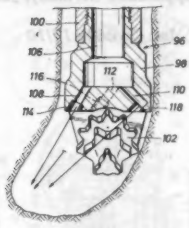
A hopper for deverting residue and cuttings from the boring machine when drilling upward. The hopper includes a main cylindrical body open at both ends. Two symmetrical deflection elements are pivotably connected to the main body of the hopper. A plate opposite the pins provides support for the deflection elements and allows them to slide to provide adjustment of the size of the central opening.

3,746,108

FOCUS NOZZLE DIRECTIONAL BIT

Gary E. Hall, 300 Tamarack St., Gretna, La.

Filed Feb. 25, 1971, Ser. No. 118,853
Int. Cl. E21b *7/04, 7/18*
U.S. Cl. 175—61 **6 Claims**



A focus nozzle directional bit according to the present invention includes a body having a central fluid conducting passage adapted to be disposed in communication with the bore of a drill string used for the drilling of a well. A plurality of branch fluid passages are formed in the body each being disposed in communication with the central fluid passage. A plurality of jet apertures are defined in the body in communication with the branch passages and are orientated to converge jets of pressurized drilling fluid outwardly and downwardly from the bit adjacent a lateral wall of the well bore for the purpose of directionally eroding the same to allow the drill bit to deviate downwardly and outwardly from the original well bore.

3,746,109

SHALE STABILIZING DRILLING PROCESS USING AN AQUEOUS SILICATE SOLUTION OF BALANCED SALINITY

Henry C. H. Darley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 10, 1972, Ser. No. 216,718
Int. Cl. E21b *21/04, 33/138*
U.S. Cl. 175—66 **6 Claims**

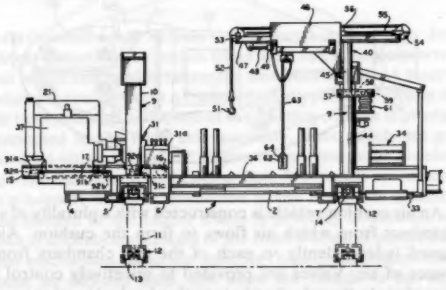
In a drilling process using a low viscosity aqueous drilling fluid of low solids content, the stabilization of a shaly earth formation is improved by using a low viscosity aqueous silicate solution having a total solute concentration that inhibits the transferring of water from the solution to the shale.

3,746,110

AUGER SECTION POSITIONING HOIST HAVING PENDENT CONTROL MEANS

William G. Young, and Frederick G. Horning, both of Salem, Ohio, assignors to The Salem Tool Company, Salem, Ohio

Division of Ser. No. 851,696, Aug. 20, 1969, Pat. No. 3,663,062. This application June 24, 1971, Ser. No. 156,458
Int. Cl. E21b *19/14*
U.S. Cl. 175—85 **6 Claims**



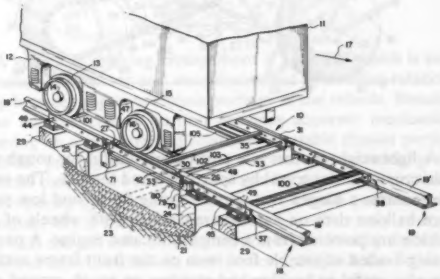
Auger apparatus, such as a coal mining machine, adapted to utilize one or more augers. Apparatus is disclosed embodying three augers in which two side augers are driven from a power source, and an intermediate auger is located between, and driven from one of, the side augers. Apparatus is also disclosed having a rigid cutting head assembly. Also disclosed is apparatus having a main gearbox connected to adjustable or removable auxiliary gearboxes, so that the apparatus can be adapted to drive one or more augers from a main gearbox. Also disclosed is an auger power system embodying two clutches. Also disclosed is a pendant control system for a hoist for handling auger sections.

3,746,111

SHORT SCALE FOR WEIGHING RAILWAY VEHICLES

Pierre P. Berthiaume, St. Laurent, Quebec; William Bowler, Pierrefonds, Quebec; George Robert Cass, Montreal, Quebec; Jan Schotman, La Prairie, Quebec; J. Frank Scott, Pierrefonds, Quebec, and Jacques Thivierge, Beloeil, Quebec, all of Canada, assignors to Canadian National Railway Company, Quebec, Canada

Filed Sept. 7, 1971, Ser. No. 178,241
Int. Cl. G01g *21/22*
U.S. Cl. 177—163 **11 Claims**



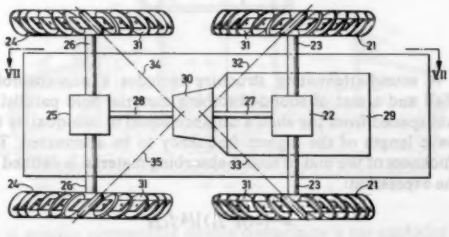
A weighing apparatus for weighing a load moveable along at least one track rail such as a railroad car. A weighing apparatus according to the invention for weighing, for example, a railroad car includes a pair of parallel weigh rails supported from and longitudinally interposed in a gap in the track rail adjacent to the weigh rail, a splice bar assembly for retaining each weigh rail in longitudinal alignment with the track rail, and a strain gauge load cell interposed between the weigh rail and the assembly supporting the weigh rail, for providing a signal indicative of the weight on the weigh rail.

3,746,112

DIRECTIONALLY STABLE SELF PROPELLED VEHICLE

Bengt Erland Ilon, Stromkarlsvagen 43, S-161 38 Bromma, Sweden

Filed Dec. 2, 1971, Ser. No. 204,129
Claims priority, application Sweden, Dec. 14, 1970, 16864/70
Int. Cl. B62d *11/00*
U.S. Cl. 180—6.2 **5 Claims**



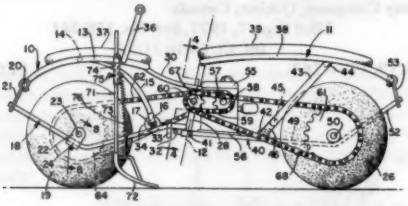
A directionally stable self propelled vehicle movable in any desired direction and equipped with at least two front and two

rear rotatable driving gears having ground contact elements mounted obliquely to the axes of rotation of the driving gears. The ground contact elements being mounted so that the ground contact lines for the front set of driving gears intersect in the backward direction and that the ground contact lines for the rear set of driving gears intersect in the forward direction.

3,746,113
MOTORCYCLE

Hubert Tidwell, Box 57, Wellington, Utah

Filed July 6, 1971, Ser. No. 159,744
Int. Cl. B62k *19/04*
U.S. Cl. 180—32 4 Claims

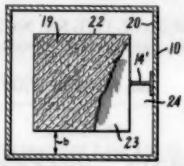


A lightweight motorcycle particularly useful for rough terrain cross-country travel by sportsmen and the like. The vehicle features a hinged two-section spring frame and low pressure balloon tires on cantilevered axles. Both wheels of the vehicle are powered from a centrally located engine. A pair of spring-loaded adjustable foot rests on the front frame section are also useful in braking and steering on rough ground and can form a stand for the vehicle at rest.

3,746,114
SOUND ATTENUATING STRUCTURE

Siegfried Sorber, Wolfsburg, Germany, assignor to Volkswagenwerke Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 15, 1971, Ser. No. 208,227
Claims priority, application Germany, Dec. 24, 1970, P 20 63 768.7
Int. Cl. F01n *1/04*
U.S. Cl. 181—50 10 Claims



A sound-attenuating structure includes a non-absorbing shell and a mat of sound-absorbing material held parallel to and spaced from the shell a distance equal to one-quarter the wave length of the highest frequency to be attenuated. The thickness of the mat of sound-absorbing material is defined by the expression:

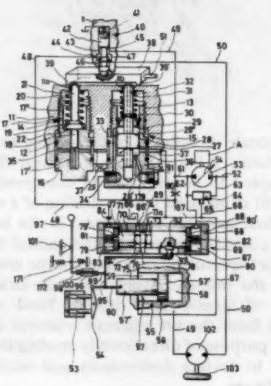
$$d=[c(f_2-f_1)]/4f_1f_2$$

where c is the propagation speed of sound in the atmosphere, f_2 is the highest, and f_1 the lowest acoustic frequency to be attenuated.

3,746,115
HYDRAULIC CONTROL APPARATUS FOR A HYDRAULIC MACHINE

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 7, 1972, Ser. No. 216,187
Claims priority, application Germany, Jan. 15, 1971, P 21 01 730.1
Int. Cl. B60k *17/10*
U.S. Cl. 180—66 R 21 Claims

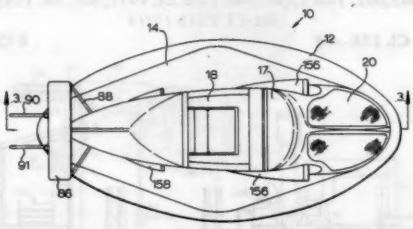


A control apparatus for an adjustable hydraulic machine includes a power amplifier for adjusting the hydraulic machine under the control of a control valve generally set by manual setting means. Limiting units are selectively and detachably attached to supporting means, and respond to excessive fluid pressure, flow, or torque, to influence a limiting valve which controls the flow to the control valve so that the power amplifier operates the adjusting means of the hydraulic machine to reduce the pumped amount of fluid so that normal operating conditions are automatically obtained. One or several limiting units can be attached and connected into the hydraulic circuit of the machine, and independently control the limiting valve.

3,746,116
AIR CUSHION VEHICLE

John Schwingshandl, 7 King St., Georgetown, Ontario, Canada

Filed June 14, 1971, Ser. No. 152,573
Int. Cl. B60v *1/12*
U.S. Cl. 180—121 11 Claims



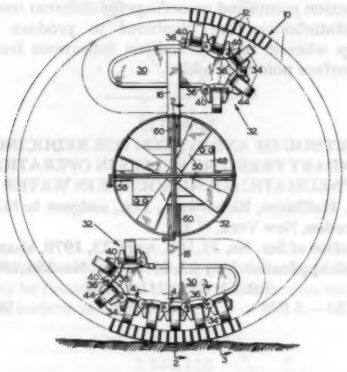
An air cushion vehicle is constructed with a plurality of sub-chambers from which air flows to form the cushion. Air is passed independently to each of the sub chambers from a source of air. Valves are provided to seleetively control the flow of air to the sub-chambers so that banked turning may be achieved. A reversing mechanism and a simple control system are described.

3,746,117

SPHERICAL VEHICLE

Ray Alred, 702 S. Yakima, Apt. 3, Tacoma, Wash.

Filed Oct. 6, 1971, Ser. No. 186,905
Int. Cl. B62d 55/00
U.S. Cl. 180—21 3 Claims



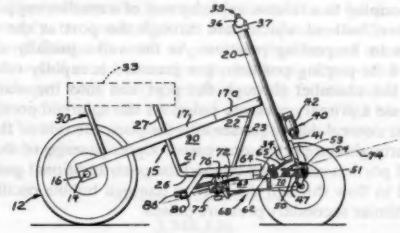
A vehicle for traversing rough terrain comprises a hollow, foraminous spherical body containing an upright frame. A pair of bearing wheel assemblies is mounted one assembly on each end of the frame with its component wheels in bearing contact with the inner surface of the sphere, thereby centering and supporting the frame. A reaction thrust engine is mounted on the frame and directed outwardly through the foramens of the body for propelling the vehicle. Operation of the engine thus causes the vehicle to roll over the ground, the interior frame, which may mount an operator's station, remaining upright.

3,746,118

THREE-WHEELED VEHICLE WITH PASSENGER BANKING

Edward J. Altorfer, 4364 Eaglemere Court, S.E., Cedar Rapids, Iowa

Filed July 15, 1971, Ser. No. 162,766
Int. Cl. B62d 7/20; B62k 5/08
U.S. Cl. 180—25 R 7 Claims



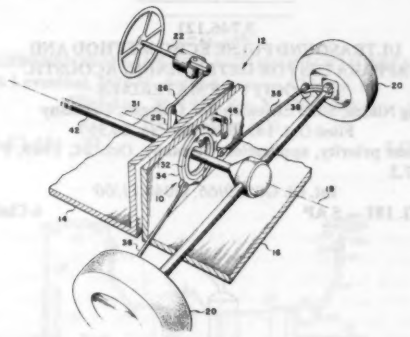
A three-wheeled vehicle is disclosed having two front wheels connected by means of an axle and a single powered rear wheel centered between the two front wheels. A steering column is connected to a frame which supports the engine and the rider, and the lower end of the steering column is pivotally connected to the front axle assembly. Foot pedals are provided on either side of the engine frame--one is for acceleration and the other is for braking. Both foot pedals are attached to a support which is connected to the front axle assembly. The bottom of the engine frame is pivotally connected to a yoke at a location rearward of the front wheels. A power-actuated mechanism banks the steering column and engine frame about an inclined bank axis when the vehicle is turned to enhance the stability of the vehicle and the comfort of the rider.

3,746,119

ROLL JOINT STEERING

John W. Cross, San Jose, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 25, 1971, Ser. No. 174,853
Int. Cl. B62d 7/08
U.S. Cl. 180—42 12 Claims



A vehicular steering arrangement is provided which is substantially unaffected and uncontaminated by a rolling relationship between separate chassis portions of the vehicle. Steering gear on one chassis portion provides accurate mechanical steering on a separate and relatively rotatable chassis portion without passing any portion of the steering connecting apparatus through the roll axis between the two chassis portions. The steering apparatus between the two chassis portions has a compact freely rotatable interconnection effectively concentric with the roll axis. Steering motion is provided by the translation of this rotatable interconnection transverse the roll axis. A continuous passageway is provided therethrough to allow an interchassis drive shaft to pass directly along the inter-chassis roll axis inside the rotatable interconnection.

ERRATUM

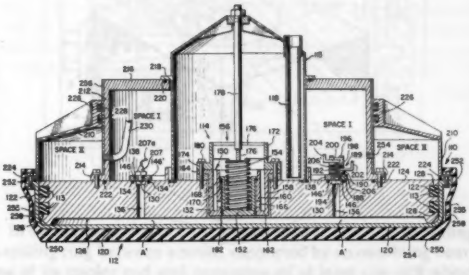
For Class 181—50 see:
Patent No. 3,746,114

3,746,120

GAS EXPLODER APPARATUS WITH SUCTION RELEASE

Lauren G. Kilmer, Tulsa, Okla., assignor to Atlantic Richfield Company, Dallas, Tex.

Filed Sept. 9, 1968, Ser. No. 758,199
Int. Cl. G01v 1/06, 1/14
U.S. Cl. 181—.5 NC 7 Claims



A seismic prospecting device comprising a gas exploder including an expansible explosion chamber having a rigid top and a rigid bottom connected together by an extensible

sidewall, resilient fastening means for attaching the top and bottom together and for normally biasing the top and bottom together, resilient sealing means inside of the joint formed between the top and bottom, gas charging and ignition means for the chamber, exhaust means for the chamber, and releasing means including a molded jacket which is fitted to the bottom of the exploder, allowing the exploder to be released from the suction of a soft land or semi-liquid medium.

3,746,121

ULTRASOUND PULSE ECHO METHOD AND APPARATUS FOR DETERMINING ACOUSTIC VELOCITY OF MATERIALS

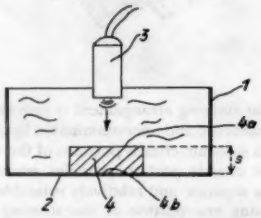
Ludwig Niklas, 5023 Lovenich Bei, Cologne, Germany

Filed Oct. 14, 1970, Ser. No. 80,597

Claims priority, application Germany, Oct. 24, 1969, P 19 53 567.2

Int. Cl. G01s *9/66*; H04b *11/00*

U.S. Cl. 181—.5 AP **6 Claims**



A method and apparatus for determining directly the acoustic velocity c_m of a material from the comparison of the ultrasonic pulse echoes obtained from the material positioned on the bottom surface of a fluid bath container with the ultrasonic pulse echoes received from the bottom of the bath container with the material removed therefrom. A cathode ray display apparatus incorporating an expandable pusle echo time base and a fixed calibrated acoustic velocity scale are employed for a direct reading from the scale of the acoustic velocity of the material.

3,746,122

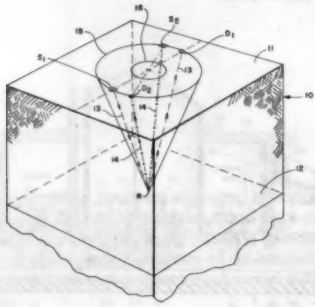
MULTI-DIRECTIONAL SEISMIC EXPLORATION METHODS

Jlee Davis, Dallas, Tex., assignor to Avance Oil and Gas Co., Inc., Midland, Tex.

Filed May 21, 1971, Ser. No. 145,811

Int. Cl. G01v *1/13*, *1/16*

U.S. Cl. 181—.5 R **21 Claims**



A number of seismic detectors are located in a two-dimensional array on the surface of the earth, either on land or at sea. One or more seismic disturbances are produced in the vicinity of the seismic detectors at points located to produce sampling of various subsurface reflection points to form one or more two-dimensional areas of coverage. For each seismic disturbance, the subsurface reflections thereof received by the various seismic detectors are recorded. In some embodiments, the seismic disturbances are produced at points located to produce multi-directional sampling of each of various subsurface reflection points and recordings for different ones of the seismic disturbances are combined to produce stacked recordings wherein multi-directional reflections from common subsurface points are added.

3,746,123

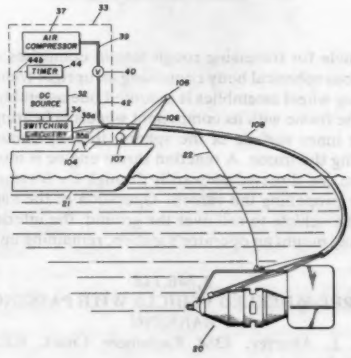
METHOD OF AND SYSTEM FOR REDUCING SECONDARY PRESSURE PULSES IN OPERATION OF PNEUMATIC SOUND SOURCE IN WATER

Donald F. Huffhines, Richardson, Tex., assignor to Mobile Oil Corporation, New York, N.Y.

Continuation of Ser. No. 31,103, April 23, 1970, abandoned. This application May 23, 1972, Ser. No. 256,197

Int. Cl. G01v *1/14*, *1/38*

U.S. Cl. 181—.5 EM **10 Claims**



The specification discloses a device employed in a pneumatic sound source for controlling the release of gas through a chamber port to minimize secondary pressure pulses. In the embodiment disclosed, the device comprises an enlarged portion coupled to a release valve by way of a smaller supporting member, both of which pass through the port as the valve moves to its porting position. As the valve initially moves toward its porting position, gas pressure is rapidly released from the chamber through the port and into the water to generate a primary pressure pulse. As the enlarged portion of the gas control device passes into the port, the rate of flow of gas through the port is decreased. Upon passage of the enlarged portion out of and beyond the port, additional gas is allowed to flow through the port to dampen bubble oscillation to minimize secondary pressure pulses.

3,746,124

ADJUSTABLE BINAURAL TUBE ASSEMBLY

Raymond Wilson, deceased, late of Gatewood Apts., No. 516, Bldg. 22, Cornwells Heights, Pa. (Kathryn Wilson, executrix), and Emanuel S. Mendelson, 931 Rt. 113, Harleysville, Pa.

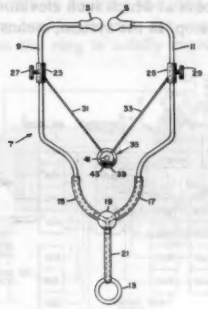
Filed Dec. 21, 1971, Ser. No. 210,416

Int. Cl. A61b *7/02*

U.S. Cl. 181—24 **4 Claims**

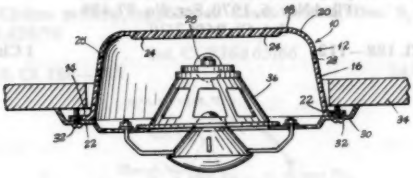
Subject invention relates to a novel and improved binaural stethoscope which allows the stethoscope ear tips to be properly positioned and maintained in the ear canals of the physician or examiner for prolonged intervals without excessive personal discomfort. The ear tubes of the stethoscope are interconnected one to the other by a leaf spring assembly that

includes a pair of leaf springs, means for adjusting the angle at which the springs are connected together at one end, and



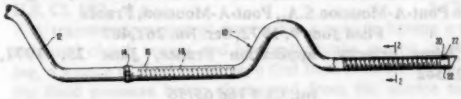
sleeves which are secured to the springs at their other end and which may be rotatably and slidably positioned on the external peripheral surface of the ear tubes.

3,746,125
PROTECTIVE SPEAKER BACK-CAN
Josef J. Hammes, St. Louis, Mo., assignor to Lowell Manufacturing Company, St. Louis, Mo.
Filed Sept. 10, 1971, Ser. No. 179,485
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B **8 Claims**



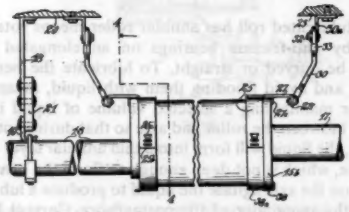
An integral organic plastic back-can for protection of loud speakers against damage and which is mildew and corrosion proof. The back-can encloses and protects a loud speaker and may simply be connected to a loud speaker baffle by a peripheral flange. In order to prevent vibration and minimize resonance and sound distortion the back-can is provided with a dish-shaped body having relatively steep frustoconical side walls joined by a gentle radius of curvature to a flat bottom. The flat bottom is provided with protruding diammetrical ribs which strengthen the bottom and prevent vibration and serve to diffuse the sound waves and minimize resonance.

3,746,126
SOUND-MUFFLING DEVICE
Ignacio de Cardenas, Box 11156 Fdz. Joncos Station, Santurce, San Juan, P.R.
Filed July 9, 1971, Ser. No. 161,047
Int. Cl. F01n *1/08*, *7/08*
U.S. Cl. 181—36 B **5 Claims**



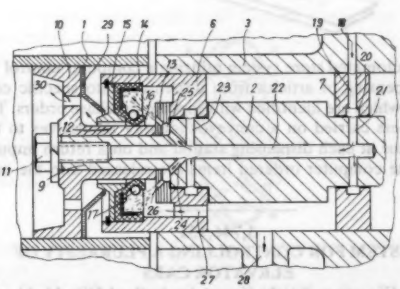
A sound-muffling device for use in muffling the explosive sounds in an exhaust gas system of the type commonly employed in internal combustion engines. A length of flat metal bar is formed into a helix having a diameter to fit into an elongated conduit in the exhaust system and to be releasably fixed therein to muffle and absorb sounds from the stream of exhaust gas passing through the conduit. The length diameter and pitch of the helix are controlled to produce the desired degree of sound-muffling without producing excessive back-pressure in the engine exhaust system.

3,746,127
SUSPENSION MEANS FOR AUTOMOBILE MUFFLERS
Jack Leventhal, 2816 W. Arthur Avenue, Chicago, Ill.
Filed Aug. 30, 1971, Ser. No. 175,929
Int. Cl. F01n *7/00*
U.S. Cl. 181—72 **4 Claims**



Means to suspend a muffler from an automobile frame. Band clamps are secured around the ends of the muffler next inwardly of the terminal marginal beads thereof. A bracket extends from each band clamp and terminates with a downbend; and cables depend from the automobile frame and are secured to the downbends. Each bracket also has an intermediate downbend applied to the end of the muffler to lock the same against endwise shifting.

3,746,128
PROCEDURE FOR IMPROVING THE SEALING OF AN AERODYNAMIC PRESSURE WAVE MACHINE AND A DEVICE TO EFFECT THE PROCEDURE
Alfred Wunsch, Friedberg, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland
Filed Sept. 28, 1971, Ser. No. 184,455
Claims priority, application Switzerland, Oct. 29, 1970, 15978/70
Int. Cl. F02f *11/00*; F16c *33/76*
U.S. Cl. 184—6.11 **5 Claims**



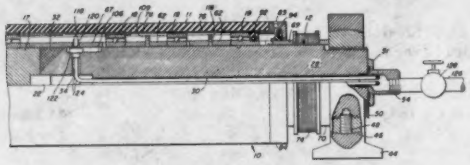
In sealing an aerodynamic pressure-wave machine including a sealing ring between a rotor, supported by an overhung bearing at its cooler end and consisting of at least one cell wheel and shaft, and the rotor-side bearing of the machine, improved sealing is secured by cooling the sealing ring with sprayed oil, the oil escaping from the sealing ring being conducted to the hot end of the cell wheel.

3,746,129

LIQUID-LUBRICATED ROLL

George P. Knapp, Waban, and Robert E. Staples, Lakeville, both of Mass., assignors to Mount Hope Machinery Company, Taunton, Mass.

Filed Feb. 24, 1972, Ser. No. 229,064
Int. Cl. F16n 7/32, 31/00
U.S. Cl. 184—6.26 22 Claims



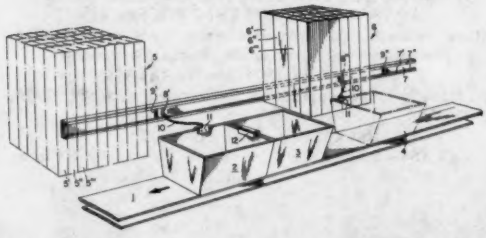
A liquid-lubricated roll has annular roller means rotatably supported by anti-friction bearings on an elongated axle, which may be curved or straight. To lubricate the bearings with a mist and avoid flooding them with liquid, means are provided for maintaining a selected volume of liquid in the passageway between the roller and axle so that during rotation of the roller, the liquid will form into a thin annular layer on its inner surface, which is not deep enough to flood the bearings. Projections on the axle agitate the liquid to produce a lubricating mist in the remainder of the passageway. Correct liquid volume is obtained by alternative means for removing excess liquid as the roller turns. An indication of the liquid volume can also be obtained by optical means.

3,746,130

AUTOMATED STORE SYSTEM

Roy K. Bullas, 226 Queen St., South, Kitchener, Ontario, Canada

Filed May 6, 1968, Ser. No. 726,969
Claims priority, application Canada, Dec. 12, 1967, 7,383
Int. Cl. E04h 3/04
U.S. Cl. 186—1 B 10 Claims



An automated store system utilizing a computer control for the dispensing of articles from dispensors into specific containers which are identified with specific purchase orders. The containers carried on a conveyor identify themselves to the computor at each dispensing station and on a return impulse from the computer ordered items are released into the container.

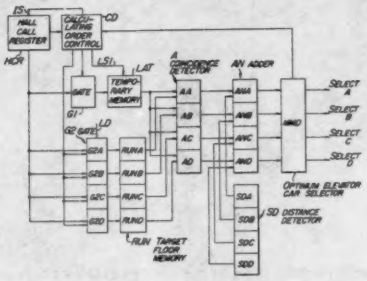
3,746,131

SYSTEM FOR CONTROLLING A PLURALITY OF ELEVATOR CARS

Kotaro Hirasawa; Koichi Kawatake, both of Hitachi-shi, and Tatsuo Iwasaka, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1971, Ser. No. 189,347
Claims priority, application Japan, Oct. 19, 1970, 45/91184
Int. Cl. B66b 1/18
U.S. Cl. 187—29 R 6 Claims

A system for controlling a plurality of elevator cars in which a hall call originating means is disposed at each floor landing so that passengers standing at the floor landing can designate the floors to which they want to be transferred, and a target floor memory is provided for each elevator car to store information as to the floors at which such elevator car has already been instructed to stop. In the system, means are provided to



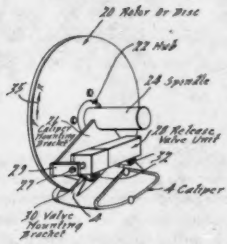
detect the coincidence between the floor numbers designated by a hall call originating from one of the floors and the floor numbers stored already in the target floor memory for each elevator car so that the elevator car for which the coincidence occurs in a greater number can be preferentially selected to be stopped at the specific floor.

3,746,132

DISC BRAKE BACK-UP RELEASE SYSTEM

Lisle Allen Jewell, Jr., Davenport, Iowa, assignor to Kelsey-Hayes Company

Filed Nov. 6, 1970, Ser. No. 87,439
Int. Cl. B60t 7/20
U.S. Cl. 188—112 1 Claim



A system for use as a brake back-up release in trailers, towed vehicles and the like, comprising a hydraulic circuit on the towed vehicle which includes a valve unit containing a three-way valve, a check valve, and an accumulator; a cam actuator means for actuating the valve unit upon backward movement of the towed vehicle; with the valve unit being operable to release brake fluid from the disc brakes upon any backward movement of the towed vehicle and also operable to store said brake fluid in the accumulator until forward movement of the towed vehicle is resumed and normal operation of the brake is desired.

3,746,133

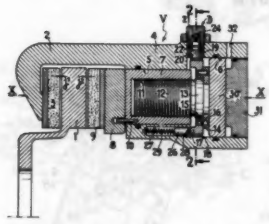
DEVICE FOR TAKING UP WEAR FOR A DISC BRAKE AND A BRAKE INCLUDING SAID DEVICE

Jean-Marc Laurent Hauth, Pont-A-Mousson, France, assignor to Pont-A-Mousson S.A., Pont-A-Mousson, France

Filed June 9, 1972, Ser. No. 261,467
Claims priority, application France, June 25, 1971, 7123342
Int. Cl. F16d 65/56
U.S. Cl. 188—196 BA 6 Claims

This device for automatically taking up wear for a brake having a disc and a brake pad caliper controlled hydraulically

and/or mechanically is of the type having a screw, a nut and a piston exerting a pressure on the screw. A ring having oblique teeth and slidably keyed on the screw meshes with a radial finger member. When braking the ring advances with the screw. When the braking ceases, the screw moves back immediately but as the ring is axially movable, it only moves



back under the effect of spring-loaded finger members when the screw and nut system is no longer under load and then rotates, if necessary, the screw with respect to the nut.

Any risk of jamming of the device taking up wear is avoided and the wear is taken up irrespective of the control means employed, namely hydraulic or mechanical.

3,746,134

FLUID-PRESSURE ACTUATORS

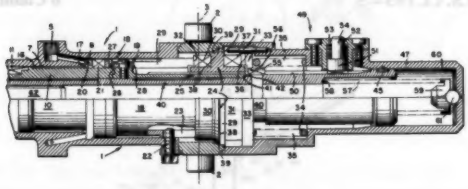
George Charles Viner, London, England, assignor to Westinghouse Brake and Signal Company, Limited, London, England

Filed Nov. 19, 1971, Ser. No. 200,377

Claims priority, application Great Britain, Dec. 9, 1970, 58,438/70

Int. Cl. F16d *65/66*

U.S. Cl. 188—203 **24 Claims**



A fluid-pressure actuator (more particularly, a brake cylinder) combined with a slack adjuster operative to telescope the output-rod parts of the actuator; the slack adjuster being rendered operative only when the "release" fluid pressure to the actuator is present and the "application" fluid pressure is absent.

3,746,135

CLUTCH AND BRAKE INCHING CONTROL

Kazuo Ishikawa, Kariya city, Aichi Pref., Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

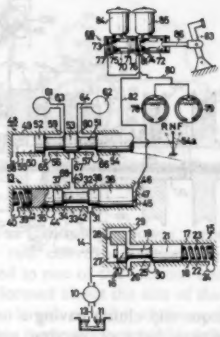
Filed Dec. 16, 1971, Ser. No. 208,680

Claims priority, application Japan, Dec. 16, 1970, 45/126548

Int. Cl. F16d *67/04*

U.S. Cl. 192—4 A **5 Claims**

A transmission control system for a vehicle having a fluid actuated clutch means and hydraulic brake means, comprising, a source of fluid pressure, a first fluid conduit for delivering fluid pressure being discharged from the source to the clutch means, a fluid pressure control valve means disposed within the first fluid conduit for automatically controlling the fluid pressure being discharged from the source and for communicating the controlled fluid pressure with the clutch means, a fluid actuated inching valve means disposed within the first fluid conduit for activating and de-activating the clutch means, and a tandem master cylinder fluidically connected to the brake means, the tandem master cylinder including a first fluid chamber connected to the brake means



through a second fluid conduit and a second fluid chamber connected to the inching valve means through a third fluid conduit, whereby even when the third fluid conduit for communicating the inching valve means with the second fluid chamber of the tandem master cylinder is damaged, the same braking force may be obtained as well as the braking force obtained normally by the depression of a brake pedal.

3,746,136

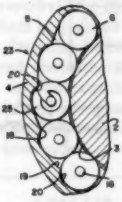
UNIDIRECTIONAL CLUTCH

Americo E. Marola, Torrington, and Gerald W. Gehrke, Litchfield, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed May 4, 1971, Ser. No. 140,092

Int. Cl. F16d *15/00*

U.S. Cl. 192—45 **6 Claims**



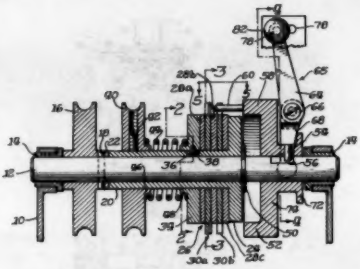
A one-way clutch including an outer member containing a bore surrounding a spaced inner member with a full complement of rollers in side-to-side engagement located around the inner member between the two members. One or more control members may be spaced between the rollers to urge the rollers in a given rotary direction against wedging ramps provided on the surfaces of one of the members to engage the clutch for driving purposes.

3,746,137

MULTIPLE-TORQUE SLIP CLUTCH

Lawrence J. Ruschke, Jr., Mount Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 7, 1972, Ser. No. 269,892
Int. Cl. F16d *7/02, 21/08*
U.S. Cl. 192—48.5 16 Claims



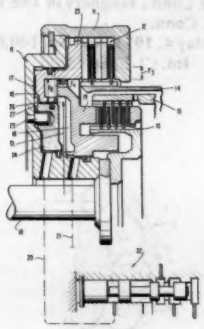
A multiple-torque slip clutch having a torque transmitting assembly of friction disks of varying torque transmission characteristics and a drive unit adapted to engage selected friction disks in positive drive relationship to enable variation the slip torque transmission capability of the clutch.

3,746,138

ACTUATING MECHANISM FOR FRICTION CLUTCHES IN AUTOMATIC MOTOR VEHICLE TRANSMISSIONS

Hans-Joachim M. Forster, Stuttgart; Ulrich Eltze, Esslingen-Liebersbronn, and Werner Hensel, Berkheim Kr. Esslingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 6, 1971, Ser. No. 131,707
Claims priority, application Germany, Apr. 8, 1970, P 20 16 712.8
Int. Cl. F16d *25/10*
U.S. Cl. 192—87.11 11 Claims



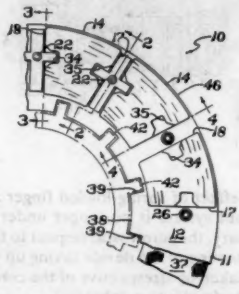
An actuating mechanism for two friction clutches, which comprises a first actuating piston for the first clutch forming at the same time the cylinder for the second actuating piston for the second clutch, whereby both actuating pistons are actuated by a pressure medium and the first actuating piston is subdivided into two partial piston sections, of which a first partial piston section actuates a first clutch and the second partial piston section is connected with the first partial piston section only in the engaging direction of the clutch while it is able to move independently of the first partial piston section in the disengaging direction.

3,746,139

FRICTION DISC MEMBER FOR BRAKE OR CLUTCH

Lowell D. Bok, Anna, and Arthur J. Thrower, Troy, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed July 19, 1971, Ser. No. 163,924
Int. Cl. F16d *13/60*
U.S. Cl. 192—107 R 3 Claims



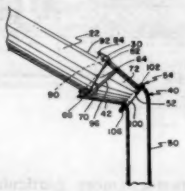
An annular plate of heat sink material having a plurality of friction lining segments on opposite faces for frictional engagement with other brake parts. Clamping members are fastened to the annular plate between the segments and have circumferentially extending arms in overlapping relation with the friction lining segments for holding them in position and protecting the annular plate.

3,746,140

CONCRETE DELIVERY CHUTE ATTACHMENT

Richard A. Schiffelbein, 3727 S.E. 21st St., Topeka, Kans.

Filed Mar. 31, 1972, Ser. No. 240,009
Int. Cl. B65g *11/00*
U.S. Cl. 193—5 6 Claims



An attachment for the discharge end of the conventional delivery chute of a concrete mixer truck, affording a flexible tube extension thereof for directing concrete accurately and without appreciable spatter to desired locations about a substantial radius of action.

3,746,141

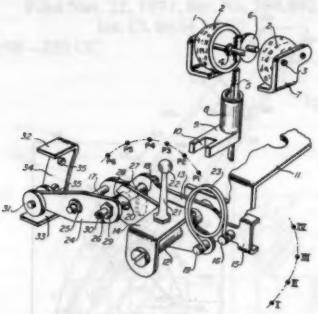
SHIFT DEVICE FOR POSITIONING SINGLE ELEMENT TYPE CARRIERS ON TYPEWRITERS AND LIKE MACHINES

Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nuernberg A.G., Nuernberg, Germany

Filed Mar. 15, 1971, Ser. No. 124,017
Claims priority, application Germany, Apr. 17, 1970, P 20 18 418.3
Int. Cl. B41j *23/02*
U.S. Cl. 197—16 8 Claims

A range shiftable motion transmitting connection between a single element type carrier and a drive lever positionable by differential mechanism to any of n discrete positions permits

positioning of the type carrier to 2(n−1) discrete type carrier positions through utilization of a translating lever responsive to movement of said drive lever through first and second



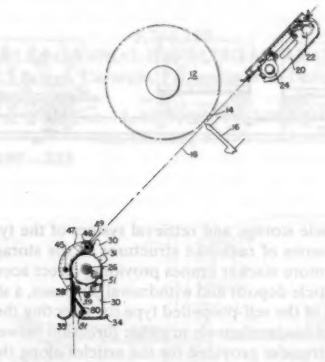
ranges of positioning movement according to the relative positions of said levers. The levers are shifted relative to one another whenever the drive lever, after having moved to one extreme position, is moved to its other extreme position.

3,746,142

LINE PRINTER PAPER TENSIONING MECHANISM

Harold E. Hepp, and James E. White, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Dec. 13, 1971, Ser. No. 207,127
Int. Cl. B41j *15/00*
U.S. Cl. 197—133 R **10 Claims**



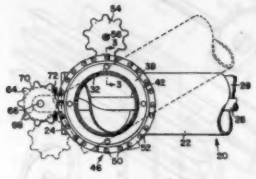
Paper tension mechanism for a line printer having an output tractor drive wherein the tension mechanism is utilized in lieu of an input tractor drive. A cross shaft has pinwheels secured near each end thereof to engage with perforated paper, and one end of the shaft carries a slip bearing and a torsion collar with a torsion spring therebetween, the spring being in contact with the bearing and the collar, and wherein the slip bearing is pinched between a fixed block and a spring loaded block. Rotation of the cross shaft, in response to driving of the output tractors, winds the torsion spring until the force is sufficient to rotate the slip bearing. The "drag" provided by the bearing applies tension to the paper in the area between the output tractors and the pinwheels, and when paper movement is stopped, as during the printing operation, the torsion spring tends to unwind and thereby holds the paper in tension. Adjustment means is also provided for the slip bearing by either increasing or decreasing the amount of pinch of the split block on the bearing, which, in turn, affects the tension in the paper.

3,746,143

DRIVE TRANSMISSION MEANS

Robert Joseph Bartusek, Des Moines, Iowa, and Elmer Richard Eckert, Horicon, Wis., assignors to Deere & Company, Moline, Ill.

Filed Aug. 13, 1971, Ser. No. 171,565
Int. Cl. B65g *37/00*
U.S. Cl. 198—88 **17 Claims**



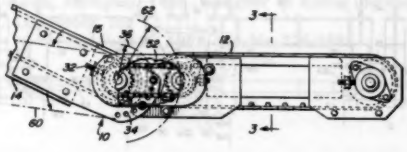
A mechanism for transmitting power across a pivotal connection between two conveyor sections, including a guide member connected to one of the sections and having a circular outer surface formed about the axis of the pivotal connection, a continuous length of roller chain encircling the guide member and having inner and outer sides relative thereto, the rollers of said chain being in rolling engagement with the surface of the guide member throughout substantially the entire length of the chain, a first sprocket drivingly connected to one of the conveyor sections and in driving engagement with the outer side of the chain, and a second sprocket drivingly connected to the other conveyor section and also in driving engagement with the outer side of the chain.

3,746,144

ADJUSTABLE CONVEYOR BRACKET ASSEMBLY

Merton L. Englert, 4671 S. 88th East Avenue, Tulsa, Okla.

Filed Jan. 6, 1972, Ser. No. 215,797
Int. Cl. B65g *37/00*
U.S. Cl. 198—91 **7 Claims**



An adjustable bracket assembly for connecting a pair of commonly driven conveyors, said bracket assembly comprising two pairs of brackets connected to the ends of the conveyors and adjustably fastened together by connection holes circumferentially spaced about the axis of a shaft rotation in one pair of brackets and correspondingly arcuately spaced connection apertures in the other pair of brackets, such that the distance between the shafts remains constant regardless of the angle between the conveyors.

3,746,145

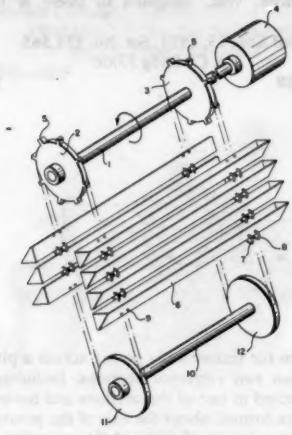
BUCKET UNIT

Hermann Moser, Darmstadt, Germany, assignor to Kalle Aktiengesellschaft, Weisbaden-Biebrich, Germany

Filed Aug. 10, 1971, Ser. No. 170,472
Claims priority, application Germany, Aug. 13, 1970, P 20 40 292.0
Int. Cl. B65g *17/12*
U.S. Cl. 198—140 **6 Claims**

This invention relates to an improvement in a bucket unit comprising a bucket chain, a drive shaft with a pair of drive

wheels and a guide shaft with two guide wheels. The improvement comprises a plurality of parallel buckets connected with

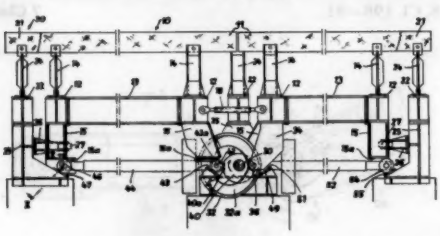


adjacent buckets by two pairs of substantially ring-shaped means passed through bores in the bucket walls, whereby a closed bucket chain is obtained.

3,746,146
COOLING BEDS

Otto Karl Buchheit, St. Ingbert, Saar, Germany, assignor to Moeller & Neumann GmbH, Ingbert/Saar, Germany

Filed Nov. 29, 1971, Ser. No. 202,917
Claims priority, application Germany, Dec. 22, 1970, P 20 63 972.9
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **6 Claims**



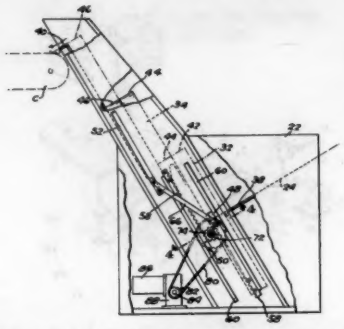
A cooling bed for rolled material has a single driving shaft from which the vertical and the horizontal movements of a first support grating relatively to a second support grating are derived. The driving shaft carries a first group of control discs with control cams for effecting the vertical movement and a further group of control discs with control cams for effecting the horizontal movement of the first support grating the control cams permitting the movement processes to be so controlled that the rolled material is extremely carefully treated during the transverse conveyance thereof.

3,746,147
ELEVATOR HAVING RECIPROCATING PLATES POSITIONED AND DRIVEN BY RACK AND PINION STRUCTURE

Paul A. Ford, 29753 Somerset, Southfield, Mich.

Filed Sept. 28, 1971, Ser. No. 184,407
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **11 Claims**

In an elevator having a series of juxtaposed plates reciprocated alternately in opposed directions to elevate articles step by step from a receiving location to a delivery location, novel structure wherein two adjacent plates in the series have at their sides a pair of opposed gear racks, each pair

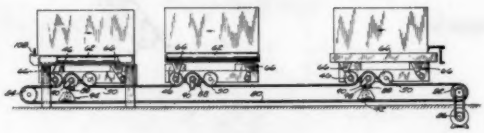


being drivenly engaged with an intermediate pinion, the pinions supporting the plates against tilting toward either side thereof.

3,746,148
SHUTTLE CAR MECHANISM FOR TRANSFERRING LOADS BETWEEN TWO STATIONS

Edwin T. Hilger, and James S. Miller, both of Louisville, Ky., assignors to Logan Co., Louisville, Ky.

Filed Mar. 8, 1972, Ser. No. 232,755
Int. Cl. B65g *25/04*
U.S. Cl. 198—219 **15 Claims**



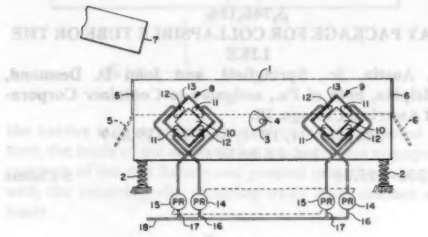
In an article storage and retrieval system of the type which includes a series of rack-like structures as the storage means and one or more stacker cranes providing direct access to the racks for article deposit and withdrawal purposes, a shuttle car mechanism of the self-propelled type for effecting the transfer of articles or loads relatively in either direction between an intermediate transfer provided for the articles along the base of the storage rack and a conveyor located along the opposed end of the mechanism. The car mechanism includes a bed portion supported by pairs of radius arms for arcuate or vertical swing movement through the transfer station and the conveyor with which it is associated as the mechanism is cycled therebetween whereby to effect the pick-up of an article or load from a first of the stations or locations and the depositing of the article or load at the second of the stations or locations. The car carries camming elements which are coupled to the radius arms of the bed portion through linkage means and which co-act with fixed camming elements in the path of travel of the car mechanism to effect a raising of the bed portion of the car at the point in the transfer cycle that the car is moving away from the load pick-up station, thereby to cause the load to be removed from such station. The bed remains elevated until the car has reached the delivery station and is proceeding relatively from the same, at which point the bed is caused to be lowered by gravity action to cause the load to be deposited at such station.

3,746,149

REVERSIBLE VIBRATORY FEEDER

Preston H. Schrader, Louisville, Ky., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Nov. 22, 1971, Ser. No. 200,892
Int. Cl. B65g *27/00*
U.S. Cl. 198—220 CC 5 Claims



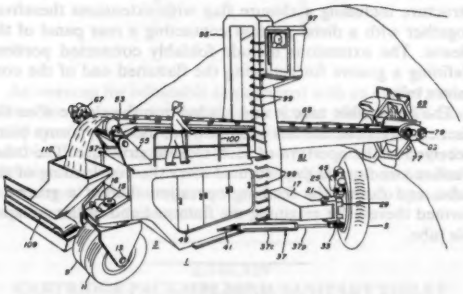
A resiliently supported vibrating conveyor or processing unit is equipped with at lease two spaced apart tunable dynamic vibration absorbers and a vibration generator. Each absorber, according to its adjustment, is effective in each of several directions to control the motion of the conveyor in response to vibratory drive force from the vibration generator. By selective adjustment of the absorbers the conveyor can be caused to convey in either direction or agitate the material in the conveyor without conveying.

3,746,150

BULK MATERIAL HANDLING APPARATUS

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1971, Ser. No. 188,000
Int. Cl. B65g *41/00*
U.S. Cl. 198—233 5 Claims



A bulk material handler is supported by a pivotable truck and two independently steerable and independently driven main wheels which stradle a loader equipped boom. For movement in a direction generally parallel to the boom, the main wheels are turned in synchronism in parallel planes. For slewing, the main wheels are turned in opposite directions until their rolling axes intersect the turning axis of the truck. For linear movement transverse to the boom, the main wheels are turned until their rolling axes are parallel to the boom. The vertically rotatable boom is pivoted at a point above the turning axis of the truck.

3,746,151

GARMENT BAG

Ira N. Brophy, New York, N.Y., and Donald Feisenthal, Memphis, Tenn., assignors to Whitmor Manufacturing Co., Inc., New York, N.Y.

Continuation of Ser. No. 889,037, Dec. 30, 1969, abandoned.
This application Oct. 15, 1971, Ser. No. 189,792
Int. Cl. B65d *85/18*
U.S. Cl. 206—7 K 1 Claim

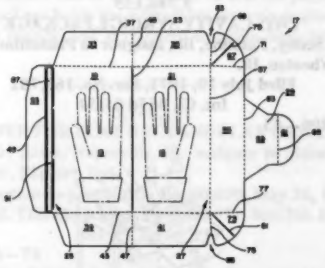
The application discloses a garment bag of conventional construction except that it is provided with an interior access affording front panel which is unsecured to the top closure member of the bag. A gripper arrangement provides such access. A stiffener is provided to under-lie the top portion of the front panel to maintain the bag dust-free and in good appearance. Preferably a dust cover is also provided which is sewn into the top closure of the bag and over-lies the top portion of the front panel. The stiffener and cover serve to maintain the appearance of the bag with the zipper either closed or partially or fully opened.

3,746,152

SURGICAL GLOVE CARTON

R. H. Allen, Memphis, Tenn., assignor to Eastex Packaging, Inc., Oak Brook, Ill.

Filed Feb. 10, 1972, Ser. No. 225,159
Int. Cl. B65d *45/06*
U.S. Cl. 206—7 F 5 Claims



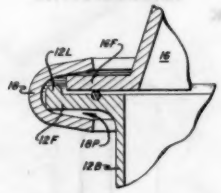
A flat sheet of cardboard suitably shaped and provided with certain fold lines and which may be folded to constitute a carton for enclosing a pair of surgical gloves and may be maintained sterile therein for an indefinite period, e. g., until the carton is opened. The carton is provided with structure which causes it to readily snap open to a flat disposition by merely pulling certain portions thereof in opposite directions, thus presenting the gloves for use in a manner which makes them convenient to don and completely free of contamination.

3,746,153

AB-TYPE PISTON ASSEMBLY SHIPPING PACKAGE

Robert W. MacDonnell, Crete, Ill., assignor to Unity Railway Supply Co., Inc., Chicago, Ill.

Filed July 13, 1972, Ser. No. 271,356
Int. Cl. B65d 85/00
U.S. Cl. 206—46 4 Claims



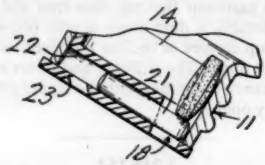
A shipping package for AB-type railroad air brake piston assemblies incorporates a shipping drum to receive and support the piston assembly in clearance relation to the drum bottom when the head flange is supported on the drum flange. An expansible locking ring is normally loosely captive upon the drum flange and is contractible to compress the flanges into sealing relationship.

3,746,154

TABLET DISPENSER

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Oct. 20, 1971, Ser. No. 191,016
Int. Cl. B65d 83/04
U.S. Cl. 206—42 3 Claims



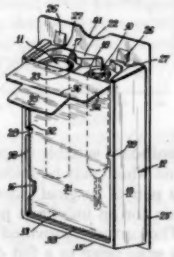
A tablet dispenser for a pill bottle. The dispenser has a cylindrical body which fits into the open neck of the bottle and defines an axially extending passage of such size that only one tablet or pill can pass through. There is a gravity actuated retainer which slides across the passage when the bottle is tipped. A part of the retainer is accessible so that it can be manually held in non-obstructing position.

3,746,155

TWO-CAVITY SYRINGE PACKAGE

Leonard Seeley, Palatine, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed July 19, 1971, Ser. No. 163,782
Int. Cl. B65d 85/54
U.S. Cl. 206—43 7 Claims



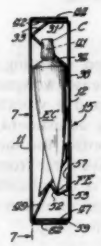
A body part of a package is formed of plastic having cavities of a configuration to receive a syringe and a vial. These cavities are open at one side and one end. A cardboard cover is placed on said side using an integral rim and locator keys on the body part to facilitate positioning. The cardboard cover is heat sealed to the body part at said side. The syringe and the vial are then inserted into the cavities through the open ends. The cover is then folded across the open ends and temporarily affixed in place with a pair of projecting detents on the body part. An extending tab on the end of the cardboard is heat sealed to a peripheral flange on the body part.

3,746,156

DISPLAY PACKAGE FOR COLLAPSIBLE TUBE OR THE LIKE

John J. Austin, Jr., Springfield, and John D. Desmond, Philadelphia, both of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 31, 1971, Ser. No. 129,849
Int. Cl. B65d 5/50
U.S. Cl. 206—45.14 5 Claims



A display carton for a collapsible tube is formed from a unitary cut and scored blank to form a carton sleeve. The sleeve is formed with an auxiliary panel supporting the tube being displayed. The auxiliary panel is connected to and extends from one of opposed side panels forming the sleeve, and extends to the other of the opposed side panels in contact therewith, the auxiliary panel having a V-configuration in transverse cross-section. One end of the sleeve is provided with a closure structure holding the tube closure in position and includes a closure flap with extensions therefrom together with a distal portion contacting the rear panel of the sleeve. The extensions have an aperture therein to receive the tube closure. The other end of the sleeve is provided with closure structure including a closure flap with extensions therefrom together with a distal portion contacting a rear panel of the sleeve. The extensions include foldably connected portions defining a groove for retaining the flattened end of the container tube.

The collapsible tube is end loaded into the sleeve after the first closure structure has been formed, the tube closure being received in the aperture of such closure structure. The other closure structure is then formed after the end loading of the tube, and during the forming operation thereof a groove is formed therein for retaining the flattened end of the collapsible tube.

3,746,157

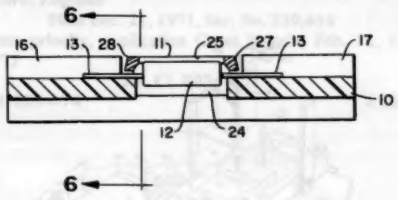
PROTECTIVE CARRIER FOR SEMICONDUCTOR DEVICES

Thomas C. I'Anson, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 26, 1971, Ser. No. 192,514
Int. Cl. B65d 73/02, 85/00
U.S. Cl. 206—46 ED 7 Claims

A two-piece carrier for flat-pack integrated circuit semiconductor devices includes a nonconductive base member with a recess for the body of a semiconductor device and a plurality of lead receiving slots. A retaining clip placed over the semiconductor device has lead engaging members on each

side for retaining and holding the semiconductor device in the carrier. The lead engaging members are plated with aluminum to short the leads of the semiconductor device during shipping and handling, but the retaining clip is loosely retained. When



the carrier is inverted and placed on a conventional test fixture, the leads of the semiconductor device are engaged by the contacts of the test fixture and pressed onto the base member, with the retaining clip dropping away from contact with the leads.

3,746,158

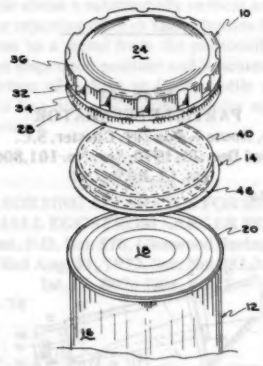
CONTAINER ATTACHMENT

Francis Glenn Connick, Downers Grove, Ill., assignor to Swift & Company, Chicago, Ill.

Filed May 7, 1971, Ser. No. 141,140

Int. Cl. B65d *79/00*

U.S. Cl. 206—47 R **4 Claims**



An overcap for releasable engagement with an end of a container having an improved rigid structure with ribs for centrally spacing an auxiliary item within same. Also an improved combination package is described comprising the overcap, the container to which it is releasably engaged, and an auxiliary item placed within a separate envelope with ribs to space the item centrally of the overcap.

3,746,159

CARTRIDGE PACKAGE FOR A SANITARY TOILET

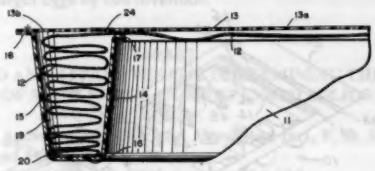
Randall L. May, Andover, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Aug. 19, 1971, Ser. No. 172,969

Int. Cl. B65d *83/00*

U.S. Cl. 206—56 R **9 Claims**

A cartridge package for a sanitary toilet includes an annular container having spaced apart inner and outer walls to provide the container with a central opening and an annular storage space. An elongated plastic tube having one end closed by heat sealing is accordion folded within the annular storage space so that the closed end extends across the central opening of the container. A thin, flexible plastic film extends across the top of the container and is secured to the outer wall thereof. The film is provided with a circular perforation spaced outwardly of the inner wall of the container to provide a detachable central portion. The tube can be withdrawn from



the storage space as desired by pushing downwardly on the central portion of the film and the closed end of the tube to detach the central portion and push it into the tube as the tube is pushed downwardly through the central opening.

3,746,160

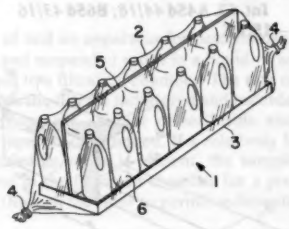
HERMETICALLY SEALED SHIPPING PACKAGE AND METHOD OF PREPARING SAME

Henry Bryan Thompson, Duncan, and Jerry Lee Mautz, Greenville, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Jan. 21, 1971, Ser. No. 108,509

Int. Cl. B65d *65/16, 85/62*

U.S. Cl. 206—65 S **6 Claims**



A hermetically sealed shipping container particularly suitable for shipping hazardous liquids is formed by placing the liquid containers on a tray, wrapping the tube and containers in a longitudinally sealed tube of monoaxially oriented and heat-shrinkable film with the film extending beyond the ends of the tray, shrinking the film tightly around the containers and tray, and thereafter applying clips to the shrunken tube openings at either end of the package to seal the package. The resulting package holds the containers securely in place, is impervious to liquids, and is resistent to acids, bleaches, or the like.

3,746,161

HOLDER FOR FLAT RECTANGULAR OBJECTS

William Earl Jones, Naperville, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

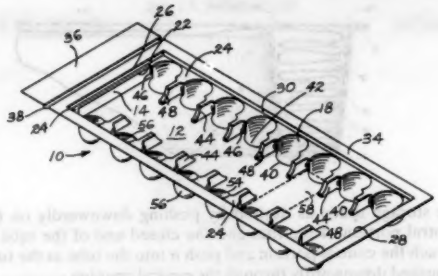
Continuation-in-part of Ser. No. 40,690, May 26, 1970, abandoned. This application June 4, 1971, Ser. No. 149,897

Int. Cl. B65d *1/34*

U.S. Cl. 206—72 **5 Claims**

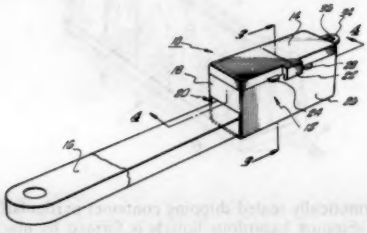
A tray-like holder for flat rectangular objects, such as microscope slides, into which such objects can be easily placed and from which such objects can be easily withdrawn comprises a base with upstanding elongated sidewalls and transverse endwalls to form a major elongated receptacle. This major receptacle is divided into individual smaller receptacles by a plurality of vertical partitions which extend transversely inwardly from each of the longitudinal sidewalls. Between adjacent partitions there is located an abutment on or adjacent to the corresponding longitudinal sidewall. A row

of openings in the base is located adjacent and generally parallel with at least one of the longitudinal sidewalls, each of the openings being located between adjacent transverse partitions. An object can be easily placed on the base between ad-



jacent partitions with one end of the object engaging an abutment and the other end of the object extending partially over a corresponding opening in the base. The object can be easily removed by placing a finger into the base opening against the exposed end of the object and l[illegible]ing the object.

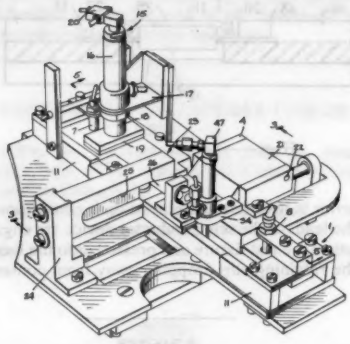
3,746,162
TOOTHBRUSH CONTAINER
Roy G. Bridges, 641 S. Fourth Avenue, Los Angeles, Calif.
Filed Sept. 10, 1971, Ser. No. 179,324
Int. Cl. A45d *44/18*; B65d *43/16*
U.S. Cl. 206—15.1 E **4 Claims**



A plastic container for storing and carrying a toothbrush has a body portion with an aperture in one end thereof through which the toothbrush handle extends so that the brush portion is retained within the body portion. A hinged lid integrally formed with the body portion closes the open top or end of the body portion by latching so as to retain the brush within the container. Drain and drying holes are formed in either the body portion or the lid or both.

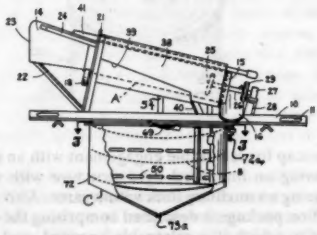
3,746,163
DAMAGED CAP EJECTOR
Charles S. Ochs, and Charles W. Probasco, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 10, 1971, Ser. No. 206,739
Int. Cl. B07c
U.S. Cl. 209—73 **12 Claims**

An improved bent cap ejector for a closure cap feed chute. A cap gauge captures and holds improperly shaped or bent caps as they pass along the chute. Sensing devices detect the resulting stoppage of cap flow and the gauge with the bent cap therein is moved clear of the chute and is opened up. An air nozzle positioned adjacent to the chute then blows the improperly shaped cap from the gauge and the gauge is then closed and is moved back into the chute. A stop is automatically operated by the gauge movement to stop the flow of caps along the chute when the gauge is moved clear of the chute. The reinsertion of the gauge into the chute disengages the stop member from the chute thereby reinstating flow of the caps. The ejection cycle may also be operated by caps with crushed covers so that they would still pass through the gauge even



though they are defective. A pair of proximity detectors sense the crushed cap and immediately activate an air operated plunger which engages the crushed cap. This stops cap flow through the chute causing the same ejection cycle to occur as occurs when a cap is caught in the gauge.

3,746,164
PARTICLE SEPARATOR
Barney L. Culp, Route 1, Box 207, Chester, S.C.
Filed Dec. 28, 1970, Ser. No. 101,806
Int. Cl. B03b *7/00*
U.S. Cl. 209—44 **8 Claims**



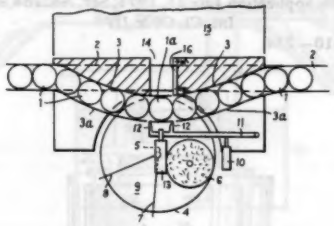
An apparatus for separating particles, such as rough diamonds, having a high specific of gravity from a mixture such as gravel. The apparatus includes a plurality of stacked disks which are immersed in water. The disks have perforations therein, decreasing in size from the top disk to the bottom. The disk are cyclic rotated forwardly and backwardly and abruptly stopped between cycles so as to cause the lighter material to be thrown off the disk and the smaller particles to drop through to the lower disk. The disks are rotated at such a speed so that the heavier particles, such as the diamonds, collect in the bottom of the disk. Positioned on top of the disk is a perforated rotating inclined drum, wherein the gravel is placed in the upper end and the material smaller than a predetermined size drops therethrough onto the top disk. The larger particles, such as rocks exit through the lower end of the drum.

3,746,165

BOTTLE INSPECTION APPARATUS

Geoffrey Ewart Ford, and Philip Sidney Waite, Kempston, England, assignors to Fords (Finsbury) Limited, Kempston, Bedford, England

Filed Dec. 21, 1971, Ser. No. 210,414
Claims priority, application Great Britain, Feb. 11, 1971, 4,489/71
Int. Cl. B07c 3/02
U.S. Cl. 209—74 6 Claims



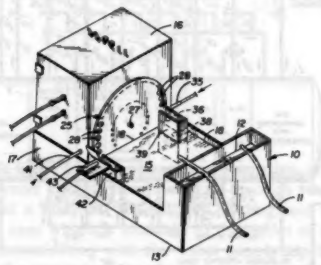
A bottle inspection apparatus for optically inspecting the bases of transparent bottles comprises a light source disposed below the inspection position through which a line of bottles is fed and a photocell device disposed above the position for scanning the base of each bottle whilst it is illuminated by the light source. As the bottles pass over the light source they are supported on a horizontal translucent plastics plate which is slowly rotatable about a substantially vertical axis. A rejection mechanism for rejecting dirty or faulty bottles from the bottle line in response to a signal from the photocell device is also disposed at the inspection position and is actuated immediately upon detection of a dirty or faulty bottle to remove the latter from the line, thereby making a pulse storage memory device unnecessary.

3,746,166

FISH EGG SORTING APPARATUS FOR SEPARATING SMALL EGGS FROM LARGER EGGS

Neil VanGaalen, P.O. Box 578, Glenwood Springs, Colo.

Filed Aug. 21, 1972, Ser. No. 282,359
Int. Cl. B07c 3/04, 5/342
U.S. Cl. 209—74 6 Claims



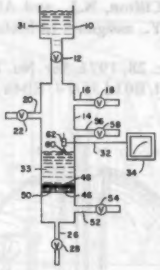
Fish egg sorting apparatus for separating small eggs from larger eggs comprising a water and egg compartment and a rotated disc partially immersed in the water in the compartment, the disc having a series of tapered holes extending from front to rear faces adjacent the disc periphery. The smaller diameter areas of the tapered holes are capable of holding small eggs in wedged positions therein. Pressurized air streams blow larger eggs out of the holes into a compartment, and blow small eggs out of wedged positions into another compartment. The disc is provided with an annular series of small holes extending through the disc located radially between the axis and periphery of the disc for passage of water from the water and egg compartment to maintain a predetermined level in the compartment. The invention may be embodied in sorting apparatus which separates dead eggs from live eggs before pressurized air is directed against live eggs for separating small eggs from larger eggs by this invention.

3,746,167

METHOD AND APPARATUS FOR DETERMINING THE AMOUNT OF SETTLEABLE AND SUSPENDED SOLIDS IN A LIQUID

Robert M. Arthur, c/o Arthur and Associates, Inc., P. O. Box 1222, Fond DuLac, Ind.

Filed Sept. 28, 1971, Ser. No. 184,374
Int. Cl. B01d 23/20
U.S. Cl. 210—70 18 Claims



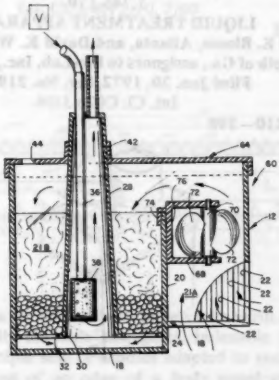
A method of and an apparatus for determining the amount of settleable and suspended solids in a liquid. A sample of the liquid is passed to a filtration chamber. The rate of flow of the sample through the filter is monitored and recorded, and from that rate of flow, the amount of settleable and suspended solids in the liquid is determined. If a relatively high concentration of settleable solids is present, the sample can be allowed to stand in the filtration chamber for a preset time before passage through the filter to permit sedimentation to take place.

3,746,168

AQUARIUM FILTRATION INDICATOR

Allan H. Willinger, Clifton, N.J.; Albert J. Dinnerstein, Far Rockaway, N.Y., and Avihu Kagan, Union, N.J., assignors to Metaframe Corporation, Maywood, N.J.

Filed Nov. 23, 1971, Ser. No. 201,502
Int. Cl. B01d 35/14; E04h 3/20
U.S. Cl. 210—87 12 Claims



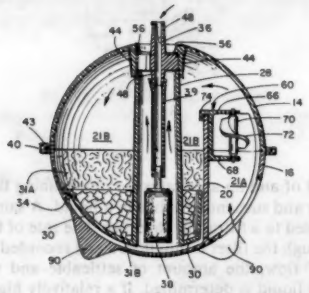
An aquarium filtering device comprising a housing in which is provided a partition for separating the housing into first and

second chambers in communicating relation. The housing is provided with at least one opening through which water may enter into the first chamber from an external water-carrying source. The second chamber includes a filtering assembly for cleansing water which has entered the first chamber and which, thereafter, flows into the second chamber. An air conduit is provided for directing air into the second chamber for drawing water through the filtering assembly. Likewise, a conduit is provided for directing both air and cleansed water out of the second chamber after the water has been cleansed by the filtering assembly. A rotary indicator is provided for signalling visually the rate of inflow of water into the first chamber and outflow from the latter into the second chamber so as to guide adjustment and cleansing of the filtering device.

3,746,169
AQUARIUM FILTRATION DEVICE

Allan H. Willinger, Clifton, N.J., and Albert J. Dinnerstein, Far Rockaway, N.Y., assignors to Metaframe Corporation, Maywood, N.J.

Filed Dec. 28, 1971, Ser. No. 213,060
Int. Cl. B01d *35/14*; E04h *3/20*
U.S. Cl. 210—87 **10 Claims**

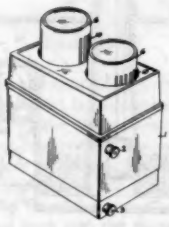


An aquarium filtering device comprising a spherical housing divided into first and second chambers in communicating relation. The housing is provided with entrance and exit openings through which water may enter and exit the housing from an external water-carrying source. The second chamber includes a filtering assembly for cleansing water which has entered from the first chamber. An air conduit is provided for directing air into the second chamber and drawing water through the filtering assembly. A rotary indicator is provided for signalling visually the rate of inflow of water into the first chamber and outflow from the latter into the second chamber so as to guide adjustment and cleansing of the filtering device.

3,746,170
LIQUID TREATMENT APPARATUS

Marshall E. Bloom, Atlanta, and David K. Walz, Stone Mountain, both of Ga., assignors to Bio-Lab, Inc., Decatur, Ga.

Filed Jan. 20, 1972, Ser. No. 219,451
Int. Cl. C02b *3/06*
U.S. Cl. 210—198 **8 Claims**

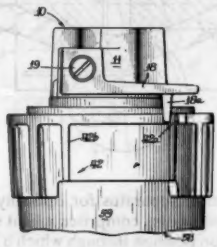


An apparatus for treating a liquid which utilizes a container in which a solid treatment chemical is disposed and which is partially immersed in a reservoir of liquid maintained at a desired level and having openings above and below the liquid level is provided with means for adjusting the elevation of the container in the reservoir thereby to control the rate at which the liquid treating substance is dissolved and supplied from the container to the liquid.

3,746,171
FILTER ASSEMBLY

Jack W. Thomsen, 921 North Street Ave., La Grange Park, Ill.

Continuation of Ser. No. 831,030, June 6, 1969, abandoned.
This application July 21, 1971, Ser. No. 164,820
Int. Cl. C02c *1/14*
U.S. Cl. 210—234 **12 Claims**

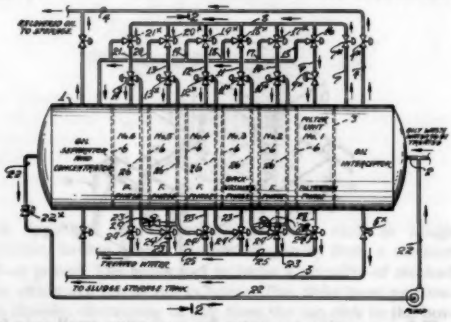


A filter assembly including a head having a built-in shut-off valve and adapted to be fixedly mounted in the line supplying the fluid to be filtered and a replaceable filter unit supported in a clamping collar which secures the filter unit to the head. Interacting cam means are provided on the clamping collar and head which functions to engage or disengage the filter unit to or from the head depending on the direction of rotation of the collar.

3,746,172
SELECTIVE MULTI-STAGE FILTRATION SYSTEM

Ross Nebolsine, 64 E. 86th St., New York, N.Y., and Guillermo San Roman, 98–50 63d Drive, Rego Park, N.Y.

Filed Sept. 22, 1970, Ser. No. 74,246
Int. Cl. B01d *35/12*
U.S. Cl. 210—253 **3 Claims**



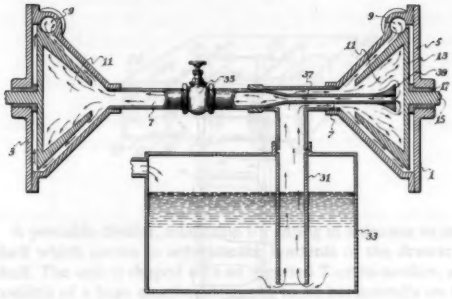
The apparatus forming the embodiment of the system, eliminates the necessity and disadvantage of a deep-bed filter of large single capacity, and provides greatly improved performance by the provision of a plurality of inter-connected filter units, and controls therefor, each filter unit being so arranged in the system as to be adapted to use one or more filter media and to be operated at its own rate and have its own back-wash cycle, and which can receive its own dosage of chemicals or poly-electrolyte, the apparatus constituting an integrated sequential controlled system.

3,746,173

LIQUID SEPARATOR

William H. Daniel, 541 Putman Road, Rogers, Ark.

Filed June 23, 1971, Ser. No. 155,767
Int. Cl. B01d 21/26
U.S. Cl. 210—258 9 Claims



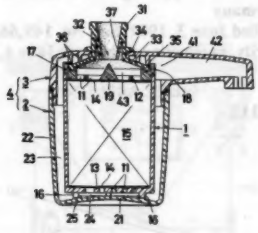
A centrifugal separator comprises a pair of centrifugal pumps of the airfoil type. A mixture of liquids of different specific gravities is fed centrally to one pump and the heavier liquid is withdrawn from the periphery of that pump. The other pump withdraws the lighter liquid from the center of the first pump and discharges the lighter liquid peripherally.

3,746,174

SIMPLE WATER TREATING APPARATUS

Kouichi Watanabe, Osaka, Japan, assignor to Kurita Water Industries Ltd., Osaka, Japan

Filed Mar. 22, 1972, Ser. No. 237,034
Claims priority, application Japan, Mar. 27, 1971, 46/17746
Int. Cl. B01d 27/02
U.S. Cl. 210—282 1 Claim



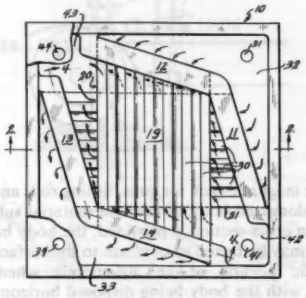
In a simple water treating apparatus comprising, a magazine containing water conditioning materials through which water is passed and a body for replaceably holding said magazine formed of a case which is attached to the outlet of the water passage communicating with the water supply tap to convey water onto the upper surface of said magazine and a lid fixed to said case to close the open top end thereof and having cylindrical adaptor to engage the tap, wherein a cylindrical water passage is formed between the inner wall of the case and the outer wall of the magazine, a radial water passage communicating at its periphery with the lower part of said cylindrical water passage is formed between the upper surface of the case bottom and the lower surface of the magazine bottom and the body is provided with a water discharge pipe for conveying water from the top of said cylindrical water passage to the outside, the improvement therein of providing on said magazine a circumferential wall extending above the water passable upper surface of said magazine and providing on said lid a flexible skirt extending downwardly from the lower end of said water passage to engage with its lower periphery the inside face of said circumferential wall thereby forming a water chamber inside the skirt, between the lid and the magazine, when the magazine is inserted into the case and the lid is fixed thereto.

3,746,175

COMPACT DIALYZER

Finley W. Markley, Naperville, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 14, 1971, Ser. No. 180,345
Int. Cl. B01d 31/00
U.S. Cl. 210—321 17 Claims



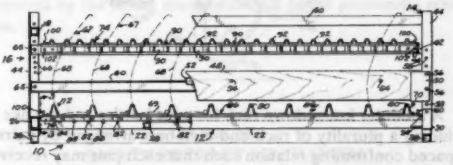
A compact dialyzer has capillary tubes orderly arranged in layers to provide a large surface area for dialysis in a small volume. Each layer of capillary tubes consists of a single row of parallel tubes whose axes are angularly disposed to the axes of the tubes in each of the two adjacent layers. The axes of the tubes of alternate layers are parallel. The dialyzer is manifolded such that a first-fluid passes through all the capillary tubes while a second-fluid passes over the capillary tubes between the layers. The capillary tubes can be channels defined between the peaks of a top pleated sheet of a semipermeable membrane and a bottom flat sheet of the semipermeable membrane to which the pleated sheet has been bonded.

3,746,176

SHIPPING RACK

Edward A. Kotlar, 21115 Mack Avenue, Grosse Pointe Woods, Mich.

Filed Aug. 2, 1971, Ser. No. 168,283
Int. Cl. A47f 5/10, 7/00
U.S. Cl. 211—13 12 Claims



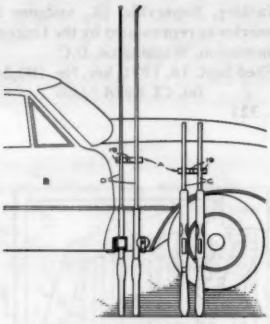
A shipping rack for vehicle body panels with vertical corner posts and laterally movable side gates. Indexable retainers each having multiple sets of saddles adapted to receive and restrain movement of an edge of a body panel provide a shipping rack which can be readily adjusted to accommodate body panels of various sizes and shapes.

3,746,177

PORTABLE MAGNETIC RACK FOR GUNS, FISHING RODS AND THE LIKE

Donald Richard Vilotti, 535 Corbitt Drive, Burlingame, Calif.

Filed Feb. 22, 1972, Ser. No. 228,206
Int. Cl. F16m 13/02
U.S. Cl. 211—64 4 Claims



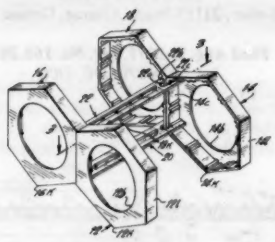
A portable magnetic rack for guns, fishing rods and the like, wherein an elongated body of resilient material substantially rectangular in cross-section is provided, the body being flexible so that it may be flexed to conform to the surface contour of a metallic portion of an automobile when pressed thereagainst, with the body being disposed horizontally. The body is impregnated with magnetic particles dispersed throughout the length thereof so that the body will be firmly secured from end to end by magnetic attraction to the automobile. The body is fashioned with a plurality of vertical slots extending thereinto from a front face of the body, the slots being unobstructed so that a selected part of an upwardly-extending gun, fishing rod or the like may be leaned into each slot for support by the body.

3,746,178

MODULAR KNOCKDOWN WINE RACK

Edward A. Wagschal, New York, N.Y., assignor to Recycled Plastic Products Corp., Bronx, N.Y.

Filed Nov. 9, 1971, Ser. No. 197,038
Int. Cl. A47b 73/00
U.S. Cl. 211—74 5 Claims



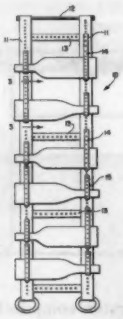
A modular knockdown rack for wine bottles and the like including a plurality of rack end members arranged by pairs in spaced confronting relation such that each pair may receive a wine bottle or the like with the rack end members being interconnected by connecting bars which releasably engage the rack end members. All of the rack end members are of identical construction and are preferably fabricated of molded plastic; and all of the connecting members are likewise of identical construction and preferably constructed of plastic such that various rack configurations can be built by the user by adding additional modules.

3,746,179

FLEXIBLE SUSPENDED WINE RACK

Gaethy Paumgardhen, Room 303, 1911 Jefferson Davis Highway, Arlington, Va.

Filed July 30, 1971, Ser. No. 167,696
Int. Cl. A47b 73/00
U.S. Cl. 211—75 5 Claims



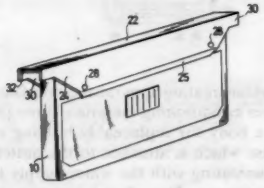
This invention relates to hanging racks for the securing of containers such as bottles for wines and liquors and the maintenance thereof in substantially horizontal position, in such manner that the labels are in full view and the position of the containers may be adjusted by loosening or tightening the retaining members forming a part of the rack.

3,746,180

DEVICE FOR FACILITATING THE STORAGE OF MAGNETIC TAPE CASSETTTES

Franz N. Spiroch, Coburg, and Karl Heinz Schmuck, Rumbeck, both of Germany, assignors to Eichner Organisation, Coburg, Germany

Filed June 3, 1971, Ser. No. 149,663
Claims priority, application Germany, June 4, 1970, P 20 27 379.4
Int. Cl. A47f 5/00
U.S. Cl. 211—113 5 Claims

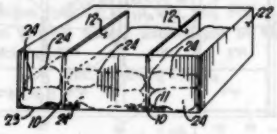


A device for facilitating the storage of magnetic tape cassettes comprises an elongate plastic rail of generally U-shaped cross-sectional configuration. The panels of each rail grip the sides of the cassette and portions of each rail extend beyond the ends of the cassette to permit the cassette to be suspended by the rail in a card index box or the like. The rail is provided with suitable releasable latch means to permit releasable latching of the rail to the cassette. In one embodiment, the end portions of each rail are provided with incisions to facilitate suspension of the rail on a wire frame.

3,746,181
DRAWER DIVIDER

Edith C. Benoit, Gales Ferry, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 26, 1972, Ser. No. 220,951
Int. Cl. A47f 5/10
U.S. Cl. 211—184 1 Claim

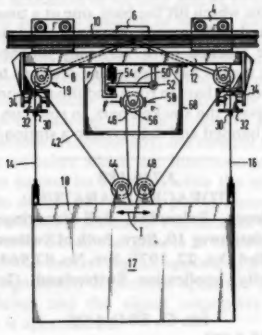


A portable divider, adaptable for fitting in a drawer or on a shelf which serves to separate the contents of the drawer or shelf. The unit is shaped with an inverted T-cross-section, and consists of a base member designed to lie horizontally on the shelf or drawer bottom, and two or more vertical rods on which vertical hollow dividers are mounted. The vertical dividers may be stacked adjoining each other, in the case of a shallow drawer, or shallow shelf, and the vertical dividers may be spaced apart from each other in the case of a deeper drawer or shelf.

3,746,182
OSCILLATION DAMPING ARRANGEMENT FOR THE LOAD CARRIER OF A HOIST

Hans Tax, PotsDamer Strasse 3, and Rodiger Franke, both of Munich, Germany, assignors to Hans Tax, Munich, Germany

Filed July 1, 1971, Ser. No. 158,938
Claims priority, application Germany, July 8, 1970, P 20 33 977.9
Int. Cl. B66c 19/00
U.S. Cl. 212—125 8 Claims

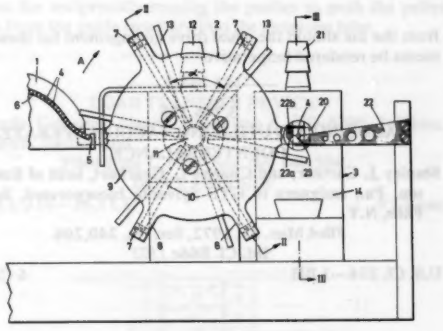


Oscillation of a load carrier on a travelling hoist in the direction of hoist travel is damped or suppressed by a stabilizing cable whose ends are wound on respective sections of the cable drum assemblies at the fore and aft ends of the hoist platform, while the central portion of the stabilizing cable is trained, in sequence, over a reversing guide pulley on the load carrier, a resiliently mounted pulley on the platform, and another reversing pulley on the load carrier. The central portion of the stabilizing cable diverges in a vertical plane parallel to the direction of hoist travel from the two pulleys on the load carrier toward the platform so that the frictionally engaged guide pulleys turn when the load carrier oscillates horizontally in the vertical plane. The pulley mounted on the platform is provided with a friction brake which impedes or suppresses its rotary movement, and thereby impedes or suppresses horizontal oscillation of the load carrier.

3,746,183
HOLDER FOR DISK-SHAPED WORKPIECES IN A PROCESSING POSITION

Reimer Stemme, Thun, Switzerland, assignor to Pierres Holding SA, Bienne/Berne, Switzerland

Filed Mar. 30, 1972, Ser. No. 239,512
Claims priority, application Switzerland, Apr. 29, 1971, 6335/71
Int. Cl. B65g 59/06
U.S. Cl. 214—1 BV 2 Claims



A holder for retaining disk-shaped workpieces in a processing position comprising at least one revolving feed or delivery arm provided at its face confronting the processing position with a protruding suction cup. A stripper bears against the end face of a suction nozzle at the processing position, the workpiece being retained by a suction nozzle against its end face and being positioned by a holding or retaining notch of the stripper. According to important aspects of the invention the stripper is constructed as a resilient arm member and possesses a control surface which is intended to cooperate with a lifting mechanism which revolves in synchronism with the feed arm, this lefting mechanism being angularly rearwardly offset with regard to the direction of revolving motion of such feed arm. The stripper cooperates with the lifting mechanism in such a manner that when the lifting mechanism arrives at the control surface the stripper is resiliently pivoted out of its workpiece holding position and the workpiece is removed by the lifting mechanism out of the processing position.

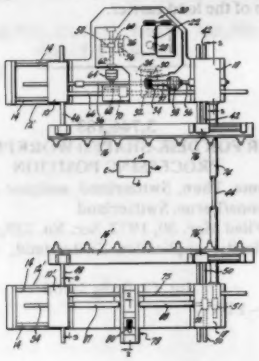
3,746,184
SAFETY RETRACT MECHANISM

Bernard J. Wallis, 25200 Trowbridge Avenue, Dearborn, Mich.

Continuation-in-part of Ser. No. 67,843, Aug. 28, 1970, abandoned. This application July 26, 1971, Ser. No. 166,280
Int. Cl. B65g 25/04
U.S. Cl. 214—1 BB 19 Claims

A safety retract mechanism for a transfer device which indexes workpieces between successive stations in a press-

mounted die. The safety retract is actuated by the press ram to remove the work-gripping elements of the transfer device



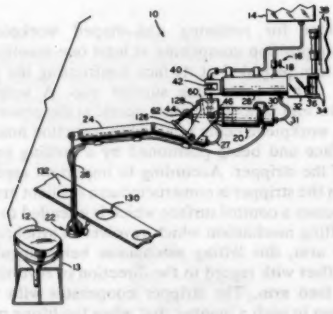
from the die should the usual drive arrangement for these elements be rendered inoperative.

3,746,185

HANDLING AID UTILIZING VACUUM OPERATED COUNTERBALANCE

Stanley J. Gartner, and Charles L. Gearhart, both of Emporium, Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Mar. 31, 1972, Ser. No. 240,206
Int. Cl. B66c *1/02*
U.S. Cl. 214—1 BH **6 Claims**



A handling aid for lifting heavy objects comprises a vacuum chuck and a vacuum operated counterbalance which is operational only when the chuck engages an object to be lifted. The counterbalance comprises essentially a piston connected to a lifting arm and a vacuum operated valve, which valve is controlled by the vacuum chuck.

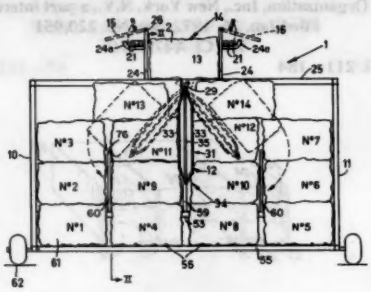
3,746,186

BALE CARRYING AND STACKING APPARATUS

Philip Thomas Taylor, Southbridge, Canterbury, New Zealand

Filed July 8, 1971, Ser. No. 160,711
Int. Cl. B65g *57/32*
U.S. Cl. 214—6 B **7 Claims**

This invention relates to an apparatus for stacking and carrying bales of hay and the like, comprising a carrier with bales stacking apparatus, the apparatus having an articulated stacking arm which is capable of directing bales into the carrier; the arrangement being such that when bales are stacked in



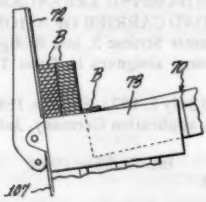
the carrier, the bales lies substantially side by side in rows with at least one row being stacked on top of another row.

3,746,187

TRANSFERRING AND STACKING ELONGATED MEMBERS

James O. Shaffer, Canfield, Ohio, assignor to Wean Industries, Inc., Youngstown, Ohio

Division of Ser. No. 864,805, Oct. 8, 1969, Pat. No. 3,627,099.
This application July 8, 1971, Ser. No. 160,936
Int. Cl. B65g *57/09*
U.S. Cl. 214—6 H **4 Claims**



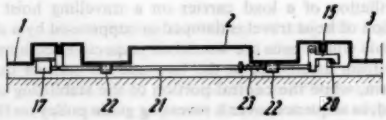
Elongated members, such as bars of metal, are removed from a run-out table, and one or more bars are transferred to star wheel means which lift the bars, one at a time, and deposit them on inclined slide means, the bars slide down the slide means and are stacked on a vertically movable support in rows. The slide means has telescoping sections to compensate for disposition of the bars in rows and the support lowers automatically to deposit the stacked bars, in rows, on car means on which they are banded and delivered to a station for removal.

3,746,188

STORAGE APPARATUS

Karl-Heinz Stienen, Rainacker, Boll-Sinneringen, and Paul Trohler, Robinsonweg 10, Bern, both of Switzerland

Filed Oct. 22, 1970, Ser. No. 82,964
Claims priority, application Switzerland, Oct. 24, 1969, 16073/69
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 CC **4 Claims**



A storage apparatus e.g. for parking automobiles, has a plurality of movable platforms arranged side by side, one of the platforms having a drive device comprising motor driven friction rollers which can be pivoted into frictional contact with

the ground and actuating elements for releasing hook couplings connecting the platforms together.

3,746,189

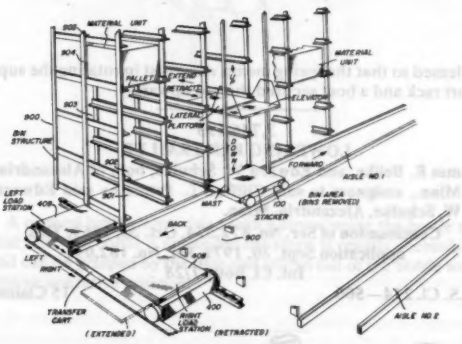
AUTOMATIC CONTROL SYSTEM FOR STORAGE SYSTEMS TRANSFER CART

Arthur R. Burch, Plainwell, and Charles E. Bates, Battle Creek, both of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 543,229, April 18, 1966, Pat. No. 3,536,209. This application July 23, 1970, Ser. No. 57,745. The portion of the term of this patent subsequent to Oct. 27, 1987, has been disclaimed.

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 B **26 Claims**



An automatic control system is disclosed for a transfer cart in a storage system in which the transfer cart moves a stacker vehicle from aisle to aisle for transferring material-units to and from bins in a selected aisle. The transfer cart is provided with aisle selector means and the bin structure is provided with aisle signal means at each aisle. Signal responsive means on the transfer cart is selectively responsive to the aisle signal means and controls the motive power means for the transfer cart. The transfer cart moves initially at a relatively high speed until it reaches the selected aisle and then the speed is reduced to approach the final position at which position responsive means causes actuation of locking means to hold the transfer cart in a fixed position relative to the bin structure with the transfer cart locked in alignment with the selected aisle. The stacker vehicle may be operated between the vehicle station on the transfer cart and the assigned bin. The control system is provided with interlocks so that the transfer cart cannot be moved unless the stacker vehicle is aboard and the locking means are released. Additionally, the control system includes aisle selector switches which are interconnected so that the aisle selection cannot be changed while the transfer cart is in motion and to disable the motive power means unless one of the selector switches is actuated. The transfer cart is driven by a reversible servo motor energizable at selected speeds in accordance with the control signals applied to a servo amplifier. The control signals are dependent upon the actuation of the selector switches and the signal responsive means as the selected aisle is approached.

3,746,190

FILLING APPARATUS FOR NUCLEAR FUEL PELLETS OR THE LIKE

Karl Hotz, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

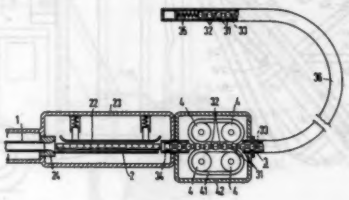
Filed Dec. 8, 1970, Ser. No. 96,175

Claims priority, application Germany, Dec. 9, 1969, P 19 61 575.9

Int. Cl. G21c *19/06*

U.S. Cl. 214—34 **7 Claims**

A filling apparatus for inserting material in pellet form into long envelope tubes where the pellets have a diameter that insures a close fit with respect to the inner wall of the envelope tube has a magazine for holding a large number of stacks of the pellets and a guide structure connectable to the magazine for holding and guiding the stacks individually. An insertion mechanism is disposed in operative proximity to the guide



structure for inserting the stack disposed in the guide structure into one of the envelope tubes to be filled. The insertion mechanism includes a tubular housing, a pusher slidably disposed in the housing and a drive device which engages the pusher for reciprocally moving the pusher to push the pellet stack from the guide structure into the envelope tube.

3,746,191

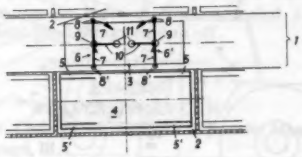
LOAD TRANSFER DEVICE

Edoardo Guiseppe Bianca, Rosenweg 6, CH-8700 Zollikon, Zurich, Switzerland

Filed June 1, 1971, Ser. No. 148,504

Int. Cl. E04h *6/06*

U.S. Cl. 214—16.1 CC **9 Claims**



The present invention concerns a load transfer device for platforms intended for the stacking of articles and exhibiting wheels, in particular for platforms for parking motor vehicles in a garage built in honeycomb style, with parking cells arranged adjacent to a shaft and a movable transport compartment in the shaft, whereby the platforms can be shifted between transport compartment and parking cell by means of crank mechanisms.

3,746,192

TAILGATE FOR A REAR LOADER REFUSE VEHICLE

William A. Herpich; Donal W. Chaney, both of Galion, Ohio, and George W. Palmer, Durant, Okla., assignors to Peabody Galion Corporation, Galion, Ohio

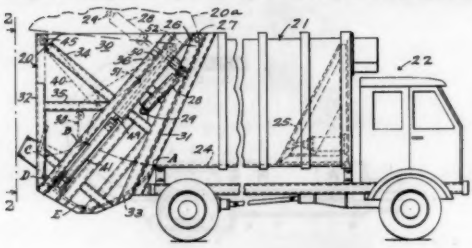
Filed July 23, 1971, Ser. No. 165,517

Int. Cl. B65f *3/00*

U.S. Cl. 214—83.3 **4 Claims**

A tailgate for a rear loader refuse truck. The tailgate has parallel vertical side walls and a hopper bottom. The hopper bottom has a generally V-shaped longitudinal section. There are a pair of parallel, straight, downwardly and rearwardly inclined guide tracks, one in the upper forward part of each side wall. A generally L-shaped packer blade is pivoted at the upper end of the upright bar of the L on a cross rod carried by slides which are movable along the guide tracks by power means. A pair of extensible cylinders are pivotally connected at the upper rear corners of the side walls and to the packer blade at points near the angle of the L. The packer blade is cy-

cled by retracting the rear cylinders, moving the slide down the guides, extending the rear cylinders and then moving the slides up the guides, to pass backwardly over refuse in the



hopper, to come down behind the refuse and to sweep it forwardly along the hopper bottom and upwardly into the truck body.

3,746,193

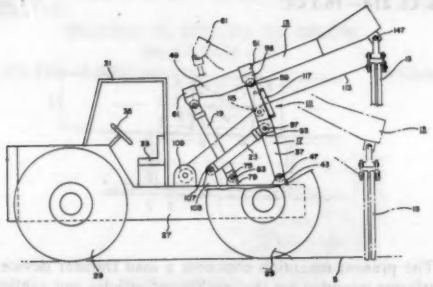
LOGGING MACHINE

Ronald S. Eaves, Louisville, Miss., assignor to Taylor Machine Works, Louisville, Miss.

Division of Ser. No. 141,263, May 7, 1971. This application Aug. 30, 1972, Ser. No. 285,101

Int. Cl. B66c *1/42, 23/36*

U.S. Cl. 214—92 **4 Claims**



A self-propelled log grapple and skidding vehicle for grappling the one end of one or a group of felled trees to skiddingly drag the trees from a wooded area to a clearing for further processing. The vehicle includes a movable boom having a grappling device depending therefrom and winching apparatus for snaking felled trees out of areas that are inaccessible to the vehicle. The boom is operably moved by hydraulic lift and tilt cylinder devices which are positioned in such a manner that they are provided maximum protection, i. e., not susceptible to being damaged when the heavy trees supported by the grappling device inadvertently collide with the vehicle. A mounting support of a fair lead for the winching apparatus is included which will assure that the winch line load is not imposed on the boom or the lift cylinders.

3,746,194

BOAT ELEVATING AND SUPPORTING MECHANISM

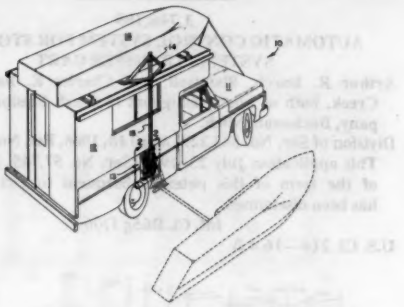
John O. Koenig, 1841 S. Oakmont Drive, Bountiful, Utah

Filed June 14, 1971, Ser. No. 152,564

Int. Cl. B60r *9/00*

U.S. Cl. 214—450 **6 Claims**

A spring biased, pivoted support mechanism adapted especially for use in elevating boats to be carried on pickup mounted camper coaches. A support arm used with a boat engaging rack is arranged to be lowered to receive a boat and a catch on a spring means of the pivoted support mechanism is



released so that the spring means can assist in rotating the support rack and a boat secured thereto upwardly.

3,746,195

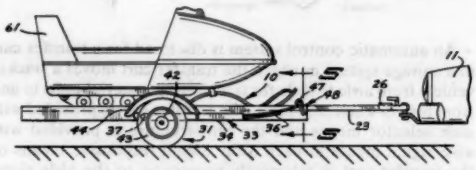
LOWERING BED TRAILER

James E. Beilke, and Edward W. Schulke, both of Alexandria, Minn., assignors to said Clifford L. Peters by said Edward W. Schulke, Alexandria, Minn.

Continuation of Ser. No. 872,524, Oct. 30, 1969. This application Sept. 20, 1971, Ser. No. 182,091

Int. Cl. B60p *1/28*

U.S. Cl. 214—506 **15 Claims**



A trailer having a rectangular frame carrying a flat floor for supporting a machine or other objects, as a snowmobile. Secured to the longitudinal center of the frame and positioned over the floor, is an elongated tongue, adapted to be connected to a towing vehicle. Pivotally mounted on opposite sides of the midportion of the frame are wheel and support assemblies operable to lower and raise the frame. Each wheel and support assembly has a transverse member rotatably mounted on the bottom of the center of the frame. A forwardly directed arm secured to the member carries a wheel positioned forwardly from the transverse member. The arm has a beam carrying a forwardly projected leaf spring. The forward or free end of the spring is turned into a transverse tubular shape to receive a U-shaped spring biased holding means. A fender, located over the wheel, is secured to the beam.

3,746,196

COATED PLASTIC CONTAINER FOR LIQUID MEDICINE

Eiji Sako, Osaka, and Osamu Kawamura, Amagasaki, both of Japan, assignors to The Green Gross Corporation, Osaka, Japan

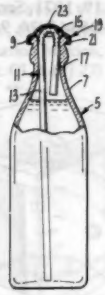
Continuation of Ser. No. 694,425, Dec. 29, 1967, abandoned. This application Jan. 29, 1971, Ser. No. 111,135

Int. Cl. B65d *23/00*

U.S. Cl. 215—1 C **4 Claims**

A polycarbonate container for an aqueous solution for medical use having a silicone resin layer on the inner surface and a layer of polyvinylidene chloride resin on the outer surface or a polycarbonate container having only a resin layer of polyvinylidene chloride resin on the outer surface. The container may be in bottle or bag form and is transparent, gas-impermeable, steam sterilization proof and does not release any detectable substances which impurify the medical solutions.

3,746,197
STRAW IN BOTTLE
Kenneth E. Sather, 101 Grand Avenue, Apt. 21, Capitola, Calif.
Filed July 21, 1971, Ser. No. 164,536
Int. Cl. B65d *23/00*
U.S. Cl. 215—1 A 1 Claim

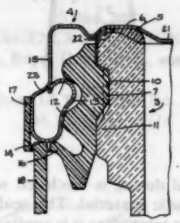


A capped bottle is provided with a straw inside the bottle so that after the bottle is uncapped the straw is readily accessible and can be grasped by the user and pulled out of the bottle and into an operative position.

3,746,198
DISPOSABLE BABY BOTTLE
Benjamin T. Howland, 5128¾ Hayter Avenue, Lakewood, Calif.
Filed Sept. 3, 1971, Ser. No. 177,606
Int. Cl. A61j *9/00*
U.S. Cl. 215—11 R 6 Claims

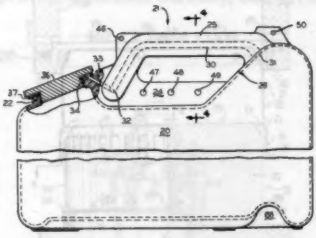
There is herein disclosed a baby bottle that is adapted to be vacuum sealed having a main body formed as a bottle to receive liquid therein, the body being provided at its upper end with external threads and a removable sealed membrane which is adapted with a pull tab for removal from the main body. A cap is threadably secured to the external threads and is provided with an enlarged central opening therein to removably receive a nipple which is used by a baby for sucking the liquid out of the bottle when the membrane is removed therefrom. To protect the sterilized nipple from contamination, there is also included a sealed cover which is readily removed when the bottle is to be used.

3,746,199
CLOSURE CAP AND SEALED PACKAGE
Alexander W. Hart, and Daniel D. Acton, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed June 14, 1971, Ser. No. 152,632
Int. Cl. B65d *53/00*
U.S. Cl. 215—40 6 Claims



A two-piece closure cap is disclosed of the type used for sealing glass and other containers. The closure cap has an inner plastic ring which is snapped onto the mouth of the container and which has means on its outer surface for threadedly engaging an outer metal cover. In the initial sealing operation, the outer metal cover is first turned onto the plastic ring so that the cover and ring as a unit may be pressed directly downwardly onto the container with a bead on the inner plastic ring snapping into locking engagement with a cooperating groove in the container finish. A tamper-proof embodiment of the plastic ring has an outer tear-off band which at least partially covers the skirt of the metal cover thereby preventing its removal from a sealed container without the plastic band being first torn off.

3,746,200
PLASTIC JERRY CAN
Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Co., Chicago, Ill.
Filed Aug. 12, 1971, Ser. No. 171,092
Int. Cl. B65d *11/10, 21/02*
U.S. Cl. 215—10 9 Claims

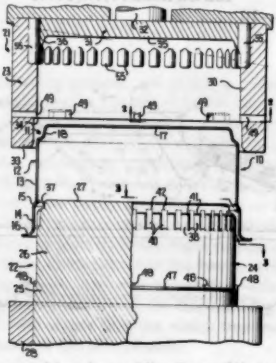


An all-plastic "Jerry Can" is made with a recessed handle and a screw-top opening. A breather tube extends from the highest part of the inside of the can, through the recessed plastic handle, to a point on the upper ledge surface of the single screw-top opening which point is sealed by the cap, when in place. When the cap is removed, air may pass from the exposed end of the breather tube and into the highest part of the can, thereby allowing the gasoline or other fluid to flow smoothly from the can, without surging caused by the successive creation and breaking of a vacuum pocket inside the container.

3,746,201
HEAT-SHRINKABLE CAPSULE
Masaaki Fujio, 3-15-8 Aoyamadai, Suita, Japan
Filed Oct. 30, 1970, Ser. No. 85,319
Int. Cl. B65d *41/02*
U.S. Cl. 215—38 A **1 Claim**

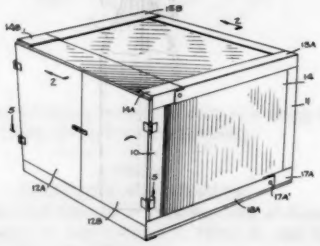
A capsule or seal device is disclosed which is made from heat-shrinkable plastic material. The seal device is not provided initially with a tab before it is applied to a bottle. Before the application of the seal device to the bottle, the cylindrical body of the device possesses two perforated lines which extend from end edge to end edge of the body and is provided at one end edge of the cylindrical body with two notches in the form of arc-shaped body portions which continue to the respective perforated or score lines. When the seal or capsule is applied to the bottle and heated to shrink closely to adhere and clinch to the bottle, the tab part located between the two body portions automatically rises up and projects from or is offset with respect to the bottle surface, resulting in forming a tab or lug projection adapted to be grasped by the fingers of a hand when the seal is to be removed from the bottle.

3,746,202
DIE FORMING AND PERFORATING PILFER-PROOF BAND OF CLOSURE CAPS
Jens L. Moller, Westmont, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 1, 1971, Ser. No. 148,604
Int. Cl. B65d *53/00*
U.S. Cl. 215—42 **5 Claims**



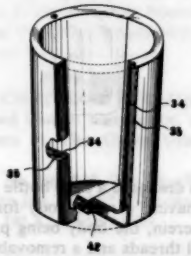
This disclosure relates to a closure cap having a pilfer-proof band wherein the closure cap is formed entirely by a die punching operation, including the perforation thereof to define the pilfer-proof band. The cap is initially die formed with an intermediate shoulder formed in the skirt, after which in a simultaneous operation the upper portion of the cap body is provided with knurling and the lower portion of the cap body or skirt is sheared through the shoulder to define a circumferential line of perforation interrupted by connecting tabs. The shoulder formation is such that when severed, reinforcing curls are provided on opposite sides of the perforation. Another feature of the die is that the knurling is effected by cooperating projections on the die with certain of the projections being in the form of pins.

3,746,203
COLLAPSIBLE CONTAINER
Henry E. Cipolla, 245 W. 75th St., New York, N.Y.
Filed Aug. 19, 1971, Ser. No. 173,039
Int. Cl. B65d *7/26, 9/14, 85/18*
U.S. Cl. 220—6 **5 Claims**



A collapsible cargo container which in the expanded state is in the form of a commodious box, and in the collapsed state assumes the form of a relatively small pack. The container is constituted by matching front and rear rectangular frames for supporting a front door and a rear wall, the side walls of the container being hinged to the sides of the rear wall and being inwardly foldable against the rear wall. Hinged to the upper corners of the front frame is the top wall assembly of the container, and hinged to the lower corner of the rear frame is the bottom wall assembly. In the collapsed state, the two frames lie in face-to-face relation, the top wall being folded against the rear wall, the bottom wall being folded against the front door, and the side walls being folded against the rear wall whereby all of the walls lie in parallel relation to define a small pack.

3,746,204
HOLLOW DOUBLE-WALL ARTICLE
Tomomasu Nagai, Tokyo, Japan, assignor to Kyoraku Kogyo Co., Ltd., Kamigyo-ku, Japan
Division of Ser. No. 32,109, April 27, 1970. This application Oct. 20, 1971, Ser. No. 190,956
Int. Cl. B65d *25/18*
U.S. Cl. 220—9 R **2 Claims**



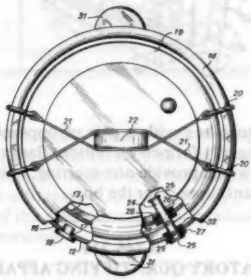
A hollow double-wall article produced by a method at least consisted of positioning at least two tubular plasticized parisons of plastic material at opposite sides of at least one core of a mold, closing half-molds of the mold about the parisons and the core to enclose said parisons within a molding cavity defined by the half-molds and the core, and introducing fluid pressure medium into the parisons, said article

including at least two plastic hollow sections being independent of each other which are welded together at one or more adjacent parts thereof, said welding being performed by welding the outer surfaces, together, at least two expanded parisons which are independent of each other, at adjacent parts thereof.

3,746,205
THERMIC POT

Andres R. Helguera, Adolfo Prieto 9, Mexico, Mexico

Filed Feb. 25, 1971, Ser. No. 118,648
Claims priority, application Mexico, July 30, 1970, 121,171
Int. Cl. A47j *27/10*
U.S. Cl. 220—13 **4 Claims**

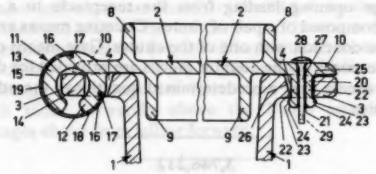


A container for use in cooking by means of steam or steam under pressure, said container comprising an inside vessel disposed within an outside shell in spaced relation thereto, said vessel and shell being fluid tightly connected together at their upper edges and forming therebetween a sealed chamber, an inlet opening into said chamber adjacent the upper edge of said shell, said inlet being closed by a removable stopper, a cover clampingly secured across the top of the vessel and provided with an aperture therein which aperture is sealed by a pressure stopper, said vessel and shell being provided with a two way valve means capable of venting the chamber to either the outside atmosphere or to the inside of the vessel.

3,746,206
CONTAINER WITH HINGED COVER

Georg Utz, Bremgarten, Switzerland, assignor to Georg Utz AG, Bremgarten, Switzerland

Filed Sept. 23, 1971, Ser. No. 183,072
Claims priority, application Switzerland, Oct. 2, 1970, 14657/70
Int. Cl. B65d *43/16*
U.S. Cl. 220—31 R **11 Claims**

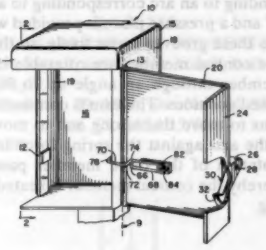


A box-shaped container has at its upper end an outwardly extending horizontal flange provided on one longitudinal side with at least two slots so as to form two hinge pins of substantial square cross section between each slot and the outer edge of the flange. The cover is provided along its longitudinal edge with two pairs of flaps, each pair comprising two oppositely disposed flap members which are curved toward each other and form a fork which partially embraces a hinge pin. A curved leaf spring extends along the outer surfaces of said flap members and is attached thereto with its inwardly bent ends which enter into slots in said flap members or engage shoulders on said flap members. The opposite longitudinal sides of the cover and box are locked together by a latch member which extends downwardly from a flange on the cover and lockingly engage the horizontal flange on the upper edge of the box.

3,746,207
EMERGENCY TELEPHONE BOX

Robert L. Lenhart, Royal Oak, Mich., assignor to W. D. Gale, Inc., Troy, Mich.

Filed June 14, 1971, Ser. No. 152,502
Int. Cl. B65d *43/16*
U.S. Cl. 220—36 **8 Claims**

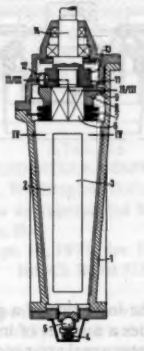


An emergency telephone box comprising a box body mounted on a pole, a cover pivotally connected to the body of the box by hinge means, a coiled torsion door spring non-movably secured at one end to the side of the box body and movably secured at the other end to the inside surface of the cover for resiliently holding the cover of the telephone box closed, and a handle secured to a cam member, which cam member is adapted to engage a projection provided within the box body on pivoting the handle to force open the cover under severe icing conditions.

3,746,208
CLOSURE APPARATUS

Karl Hotz, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 30, 1970, Ser. No. 93,788
Claims priority, application Germany, Dec. 4, 1969, P 19 60 846.9
Int. Cl. B65d *53/00*
U.S. Cl. 220—46 R **5 Claims**



A closure apparatus is provided for passing materials therethrough into an opening of a chamber in which the pres-

sure can range in value above or below atmospheric pressure and for sealing chamber pressure tight after the materials are placed therein. The apparatus has a conical member having a longitudinal axis. A housing dimensioned to accommodate the conical member is also provided. The conical member has a slot extending therethrough and is journalled in the housing so as to be rotatable to open and close positions whereat the slot is aligned with the opening of the chamber and the slot is closed with respect to the latter respectively. A stud extends from the wider end of the conical member in a direction along the axis of the latter. A pressure piece is in non-rotational engagement with the stud and is slidably mounted thereon so as to be movable along this axis. A spring is seated on the stud between the end of the conical member and the pressure piece for applying a pressure force against the latter. A rotatable drive member is provided and has a bearing means in engagement with the pressure piece. A cam surface is provided on the pressure piece and supports the bearing means and presses thereagainst by the action of the spring. The housing has grooves extending to an arc corresponding to an angle of substantially 90° and a pressure piece is provided with projections extended into these grooves respectively, so that the pressure piece and the conical member are rotatable by a rotation of the drive member through an angle up to 90° between the open and closed positions. The cam is contoured to permit the bearing means to move therealong and to move the pressure piece along the axis against the spring force in response to a continued rotation of the drive member passed the closed position, whereby the conical member is seated pressure-tight in the housing.

3,746,209

CLOSING DEVICE FOR GAS AND LIQUID CONTAINERS

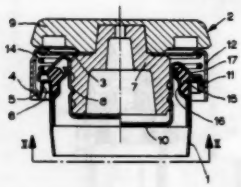
Norbert Urban, Bienrode, and Hans Richters, Wolfsburg, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 2, 1971, Ser. No. 177,340

Claims priority, application Germany, Sept. 5, 1970, P 20 44 182.1

Int. Cl. B65d *41/05*

U.S. Cl. 220—40 R **8 Claims**



A cap for closing the inlet pipe of a gas and/or liquid container. The cap includes a number of interacting parts which are operative to compress a seal arranged between the cap and the inlet pipe without sliding contact when the cap is closed, and operative to release the seal without sliding contact when the cap is opened.

3,746,210

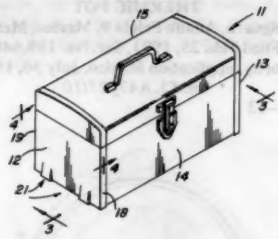
INTEGRALLY FORMED GLIDE-LIKE SUPPORTS FOR A TOOL BOX AND THE LIKE

Jack Evans, Grant Park, Ill., assignor to Park Manufacturing Company, Grant Park, Ill.

Filed Feb. 3, 1971, Ser. No. 112,318

Int. Cl. B65d *7/42*

U.S. Cl. 220—70 **6 Claims**



In a metal tool box with a pair of opposed cap end type walls, feet integrally formed on bottom flange portions of the cap end walls, which provide non-marring, weight-bearing and collapse-resistant support for the box.

3,746,211

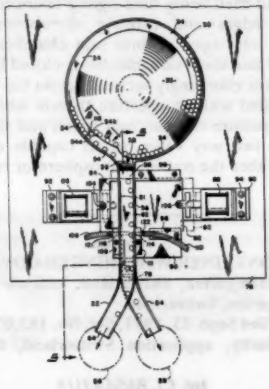
VIBRATORY QUANTIFYING APPARATUS

Warren C. Burgess, Jr., 31922 Lake Road, Avon Lake, Ohio

Filed Dec. 6, 1971, Ser. No. 205,266

Int. Cl. B65g *51/42*

U.S. Cl. 221—7 **19 Claims**



There is provided a vibratory quantifying or counting apparatus which includes a vibratable receptacle for parts or individual items of common geometrical configuration and a discharge opening leading from the receptacle to a chute system composed of a pair of chutes. Counting means are provided for coaction with one of the chutes. Gate means operative in response to the counter means are provided for diverting any excess over a predetermined quantity to the other of said chutes.

3,746,212

DEVICE FOR ISOLATING TEXTILE COILS

Manfred Anderheggen, and Heinz Buhren, both of Monchengladbach, Germany, assignors to W. Schlafhorst & Co., Monchengladbach, Germany

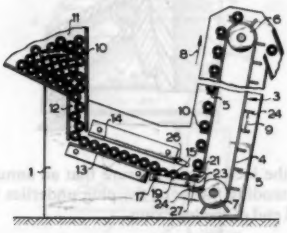
Filed May 25, 1971, Ser. No. 146,740

Int. Cl. B65h *3/36*

U.S. Cl. 221—253 **2 Claims**

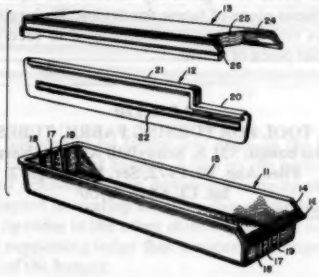
Device for isolating textile coils delivered from a coil supply by a transporting device having entrainers mutually spaced

thereon, adjacent pairs of the entrainers forming respective troughs for receiving a textile coil therein for transport by the transporting device, includes, at a location at which a textile coil is initially received in a respective trough opening, a pair of guide runners spaced from one another on opposite sides of the trough for supporting the tip and the foot, respectively, of



a textile coil received in the trough through the opening thereof, the pair of guide runners having means for determining the position of the central longitudinal axis of the respective textile coil with respect to an outwardly extending edge of the entrainer of the respective trough by which the respective textile coil is entrainable.

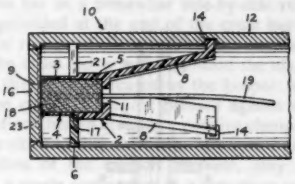
3,746,213
UNIT PACKAGE DISPENSER
Robert B. Morrison, North Muskegon, Mich., assignor to E. H. Sheldon and Company, Muskegon, Mich.
Filed June 28, 1971, Ser. No. 157,346
Int. Cl. B65d *83/10*
U.S. Cl. 221—303 **1 Claim**



A dispenser for unit dose medication in sealed plastic packages comprises a container and lid providing a storage chamber and an access chamber, the lid terminating short of the front end wall of the container and having a depending flange spaced from the bottom of the container whereby when the container is supported in a downwardly-inclined position the flange will engage the lowermost light plastic package which slides forwardly above the flange and keeps the packages above from falling forward.

3,746,214
DETONATOR HOLDER
Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.
Filed July 15, 1971, Ser. No. 162,898
Int. Cl. F42c *19/00*
U.S. Cl. 222—3 **3 Claims**

An apparatus for holding an explosive charge in place at the outlet of a gas filled chamber. A holding means which may be provided with a plurality of legs, is provided with a receptacle means to accommodate and keep stationary the explosive charge, against the outlet, inside the chamber. Means are pro-



vided on the inside surface of the chamber to accommodate the legs, if provided, to assist in keeping the holding means and thus the explosive charge, stationary.

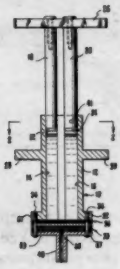
3,746,215
RECLOSABLE SEALED POURING BAG
Anne Marie Eva Ausnit, and Steven Ausnit, both of 121 E. 61st St., New York, N.Y.
Filed Jan. 29, 1971, Ser. No. 110,982
Int. Cl. B65d *35/08*
U.S. Cl. 222—92 **6 Claims**

A flexible container having a pouch portion and an opening leading to the pouch. The opening is releasably closable by flexible rib and groove elements formed along the walls of the container. A funnel portion attached to the walls of the container is normally positioned internally of the pouch portion when the container is not being used and is readily extensible outside the pouch when the rib and groove elements are opened and it is desired to remove contents from the container. The funnel portion may come to a point or apex to form a spout which when snipped at the tip thereof allows the contents of the pouch to be controllably released from the container without interfering with the operation of the rib and groove elements.

3,746,216
FLUID MIXER-DISPENSER
Arthur F. Frederick, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 10, 1971, Ser. No. 179,379
Int. Cl. B67d *5/52*
U.S. Cl. 222—137 **3 Claims**

A fluid mixer-dispenser for use with two component adhesives including a generally cylindrical body having a pair of adjacent parallel cylindrical bores within which a pair of pistons are slidably mounted. A valve system fluidly seals the end of the bores and comprises three thin circular discs, one of which is a solid rupture disc and the remaining two flanking discs

have appropriately shaped cutouts therein to prevent premature rupture due to backpressure when used in an underwater environment and to provide rupture at the appropriate internal pressure due to depression of the pistons. A mixing chamber is provided and includes a plurality of discs having appropriately formed cutouts such that when stacked, form passages for the fluids to flow through.



3,746,217

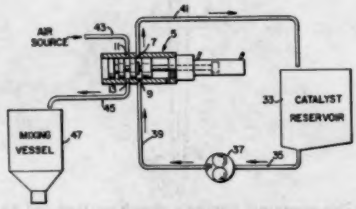
MEASURING SYSTEM

Eugene Hanset, 720 Capitola Road, and Richard E. Hanset, 510 Seaside St., both of Santa Cruz, Calif.

Filed Sept. 7, 1971, Ser. No. 178,162

Int. Cl. G01n *1/20*

U.S. Cl. 222—194 **2 Claims**



A metering system is provided for catalysts and similar materials which must be precisely measured in small amounts by providing a double chambered valve whereby the catalyst can be kept in circulation at all times, preventing aeration and providing for accurate measurement into small portions. In a preferred embodiment of the invention, the catalyst chamber is made variable so that adjustments can be made in the volume dispensed.

3,746,218

ATTACHING A DISPENSING VALVE TO A PRESSURIZED DISPENSER

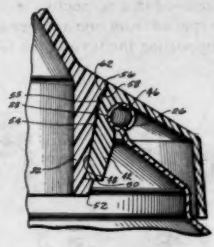
Merle G. Risdon, Norwalk, and Ronald A. Meyer, Mission Viejo, both of Calif., assignors to Sterigard Corporation, Irvine Industrial Company, Santa Ana, Calif.

Filed Sept. 15, 1971, Ser. No. 180,646

Int. Cl. B65d *83/06*

U.S. Cl. 222—394 **10 Claims**

A dispensing valve is secured to a standard dome of a pressurized dispenser through a lock ring and a depending plug portion of the dispensing valve housing. The lock ring, around an undercut section on its external radial surface, lies in conforming and compressive engagement with the inner radial surface of a bead which bounds the opening through the dome. The lock ring is forced tightly against the bead by the plug through complementary tapered surfaces of the two. The taper of the lock ring exceeds that of the plug to allow the plug to overtravel and elastically expand the lock ring during its assembly with the lock ring to be sure that an annular, radially outwardly extending flange of the plug underlies the extreme interior, axial end of the lock ring.



3,746,219

RUFFLE FORMER

Alice M. Penland, 433 Pennsylvania, Wichita, Kans.

Filed May 17, 1971, Ser. No. 143,885

Int. Cl. A41h *43/00*; D06j *1/00*

U.S. Cl. 223—35 **1 Claim**

A fabric press is a generally circular or square mold to receive a moist piece of fabric for drying. A plurality of ridges and valleys make the mold ruffle-shaped to receive, dry and press a moist piece of fabric.

3,746,220

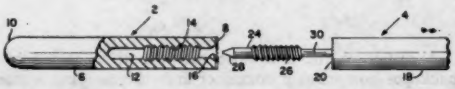
TOOL FOR TURNING FABRIC TUBES

John A. Harbaugh, 531 S. Schuylkill Avenue, Norristown, Pa.

Filed Aug. 24, 1972, Ser. No. 283,572

Int. Cl. A41h *43/00*

U.S. Cl. 223—42 **4 Claims**



A tool for turning tubular fabric belts, piping and the like inside out comprises first and second separable cylindrical elements which meet endwise to clamp fabric between their ends. Secure clamping of fabric is insured by the engagement of screw threads in the respective elements.

3,746,221

DUMMY HEAD FOR SUPPORTING WIGS DURING DRYING

Raffaello Grifoni, Via Vallombrosana 15, Pelago, Italy

Filed Jan. 26, 1972, Ser. No. 220,973

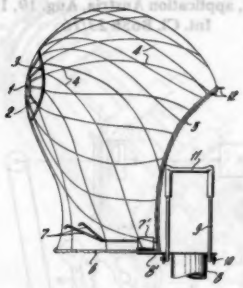
Claims priority, application Italy, Jan. 28, 1971, 9334 A/71

Int. Cl. D06c *15/00*

U.S. Cl. 223—66 **7 Claims**

The dummy head is a hollow body having the shape of a human head with a wide frontal opening corresponding sub-

stantially to the face portion, the body being formed by a net-type structure. The net-type structure peferably is formed by interlaced wires extending forwardly and downwardly from a zonal portion at the rear of the head. The neck portion of the body is open at the bottom, and the peripheries of the two



openings of the body are formed with prongs or hooks for engaging and retaining a wig draped over the body. The body is arranged to be supported in an electric dryer by a tubular member engageable over a post or the like and having a pair of diammetrically opposite handles pivotally connected thereto.

3,746,222

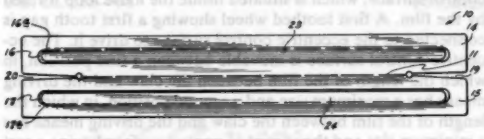
GARMENT HANGER SHEET MATERIAL

Irving D. Tiss, 2 Archbridge Lane, Springfield, N.J.

Filed Sept. 27, 1967, Ser. No. 670,928The portion of the term of this patent subsequent to July 17, 1987, has been disclaimed.

Int. Cl. A47j *51/097*

U.S. Cl. 223—87 **5 Claims**



A device adapted to be folded and hung on the horizontal support bar of a garment hanger. A flap on the bottom edge of an elongated opening in one downward-hanging skirt of the device is adapted to overlap a similar flap on the bottom edge of a similar opening in the other skirt to provide a supplemental garment supporting ledge that is wider and longer than the support bar of the hanger.

3,746,223

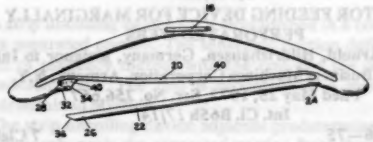
MOLDED GARMENT HANGER WITH CLAMPING TROUSER BAR

John H. Batts, E. Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Apr. 28, 1971, Ser. No. 138,064

Int. Cl. A47j *51/14*

U.S. Cl. 223—91 **15 Claims**



An integrally molded garment hanger having a conventional contoured body which includes a header portion, and a pair of downwardly extending curved divergent legs. The body also includes a cross bar interconnecting the legs at their extremities and a clamping bar cantilevered to the end of the cross bar adjacent one of the legs and extending adjacent the front face of the cross bar in a somewhat side-by-side relationship. A keeper is provided at the end of the cross bar adjacent the other leg for receipt of the free end of the cantilevered clamping bar. The cross bar is arched toward the clamping bar so that when the latter is secured by the keeper, both the cross bar and the clamping bar are pressed against each other to forcibly deflect therein creating a positive clamping force on a garment positioned therebetween. The entire structure, with the exception of the support element, may be integrally molded as a single component in a two-piece mold structure opening by simple movement of the mold valves in opposite directions.

3,746,224

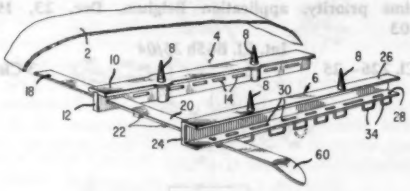
INTERNAL SKI RACK FOR AUTOMOBILE

Claus-Peter Folgner, P.O. Box 292, Pineville, Pa.

Filed Mar. 18, 1971, Ser. No. 125,554

Int. Cl. B60r *11/00*

U.S. Cl. 224—42.1 C **1 Claim**



Racks for supporting skis within a vehicle adjacent the roof thereof are provided with two longitudinally spaced transversely extending rigid strips of material with the strip located closer to the front of the vehicle being provided with openings through which the tail portions of skis may be passed and with the strip located closer to the rear of the vehicle being provided with flexible and preferably elastic elements, such as conventional ski clips, for holding the portions of the skis near the tips thereof in place.

3,746,225

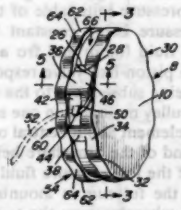
DENTAL FLOSS DISPENSING CASE

John L. Runckel, Lake Oswego, Oreg., assignor to Skyline Northwest Corporation, Portland, Oreg.

Filed Apr. 1, 1971, Ser. No. 130,392

Int. Cl. B26f *3/02*

U.S. Cl. 225—19 **9 Claims**



A storing and dispensing pocket-type case for a roll of withdrawable dental tape. The case is hollow and embodies spaced parallel walls having outer marginal edges joined by an encircling rim. The outer peripheral surface of the rim is provided with first and second outstanding annular ribs. These ribs have inward edges spaced apart a prerequisite distance to define an intervening annular channel of requisite width and

depth. A predetermined portion of the bottom of the channel is provided with a transverse dispensing slot through which the free withdrawable end of the tape is accessible. At a circumferentially spaced point a clip is confined in the channel and is provided with a struck-out tongue. This tongue is nested within the confines of the channel and provides a safeguarded tape cutting blade. That portion of one rib which is proximal to and situated between the slot and cutting blade is provided with an outwardly opening tape threading and holding groove. The portion of the tape between the slot and blade is guidingly passed through the groove and facilitates piloting the terminal end toward the blade. The tape beyond the blade is severed and used and the tape between the blade and slot and guiding groove is accessible for controllable use.

3,746,226

YARN FEED MECHANISM WITH CONSTANT THROUGHPUT AND PNEUMATIC TENSION REGULATION

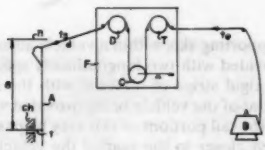
Francis Leclercq, Chemin 21, No. 26, Tournai, Belgium

Filed Dec. 23, 1971, Ser. No. 211,533

Claims priority, application Belgium, Dec. 23, 1970, 760,803

Int. Cl. B65h *25/04*

U.S. Cl. 226—25 **3 Claims**



This invention is directed to obtaining and maintaining a constant tension on yarn being taken from a spool thereof and directed to a sewing needle, effected by employing a constant speed roller revolvaly driven around an axis variably movable to and fro relative to fixed yarn guides before and after the roller, movement of the axis away from the guides placing greater tension on the yarn and moving toward the guides (or toward an intermediate position between the guides) lessening tension on the yarn, the movement of the axis being effected by force of high pressure or high leverage and being responsive to a minor low pressure initiatable of the high pressure system, the high pressure being constant but the valve(s) directing the flow of fluid for to and fro action of the axis being controlled by a piston-like valve responsive to the low pressure, and there being subsequent to the roller and guides in yarn-flow series a pulley mounted on one end of a lever arm pivoted on a fulcrum element about central of the arms length and at the opposite end of the arm there being a blade-valve for turning on and off the low pressure fluid to opposing bellows between which the fulcrum is mounted in suspension therebetween fixedly, whereby upon the tension on the yarn running around the pulley becoming greater or lesser, the blade-valve opens or closes to release low pressure fluid which released fluid moves the fulcrum upwardly or down-wardly by effecting bellow action negatively and positively on the respective opposing bellows, while concurrently the released or terminated low pressure acts on the piston valve for turning on or off the high pressure for moving to or fro the axis of the roller between the fixed guides.

3,746,227

RECORDING OR REPRODUCING APPARATUS

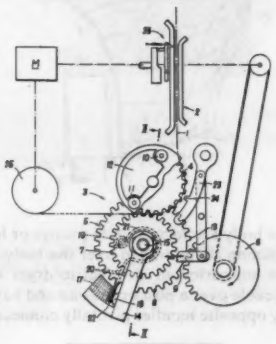
Erwin Krob, and Josef Morell, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hausen, both of Vienna, Austria

Filed Aug. 16, 1972, Ser. No. 281,049

Claims priority, application Austria, Aug. 19, 1971, 7283

Int. Cl. B65h *23/16*

U.S. Cl. 226—36 **3 Claims**



In a motion picture apparatus for perforated film including a film gate, a film claw, and means for moving the claw in-and-out and up-and-down relatively to the gate to intermittently engage the perforation of the film and to advance the film through the gate. Driving means are provided for the film and the latter forms a loose loop between the claw and the driving means. A motor is arranged to drive the driving means and the means for moving the claw. A loop restorer has an eccentric control surface, which is situated inside the loose loop formed by the film. A first toothed wheel showing a first tooth gap is connected to the eccentric control surface to drive it. The eccentric control surface is movable between a first position, in which the length of the film between the claw and the driving means has a maximum size and a second position, in which the length of the film between the claw and the driving means has a minimum size and the eccentric control surface having a rest position situated between the first position and the second position, in which rest position the control surface is out of engagement with the film in the film loop, so that a shortening film loop engaging the eccentric control surface will move it to the first position; a second constantly rotating toothed wheel, the second toothed wheel being driven by the motor in synchronism with the claw. The first tooth gap of the first toothed wheel is adjacent to the second toothed wheel, when the eccentric control surface is in the rest position. The second toothed wheel showing a second tooth gap of a range that corresponds to the part of the cycle of the claw movement, in which the claw is in engagement with the perforation of the film, whereas the second toothed wheel is toothed in a range corresponding to the part of the cycle of the claw movement, in which the claw is out of engagement with the perforation of the film.

3,746,228

TRACTOR FEEDING DEVICE FOR MARGINALLY PERFORATED WEBS

Sieghard Arnold, Hildrizhausen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

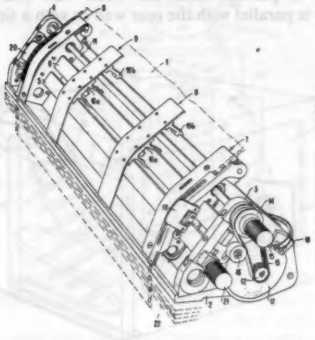
Filed May 25, 1972, Ser. No. 256,667

Int. Cl. B65h *17/14*

U.S. Cl. 226—75 **7 Claims**

A feeding device for marginally perforated webs of material in which pins for engaging the perforations are spaced about the periphery of an endless, toothed belt supported for rotation by a pair of toothed feed wheels rotating on parallel axes.

The web is led over a cylindrically shaped guide surface in the area of engagement with the pins and the bridge supporting the belt is also cylindrically shaped. The radius (R1) of the guide surface in relation to the radius (R2) of the pitch circle of the belt corresponds to the relation of the perforation spacing (T1) of the web to the pitch (T2) of the pins on the belt (R1/R2 equal T1/T2). Also, the circumference of the circles with the radii R1 and R2 amounts to an integral multiple of the pitch T3 of the feed wheels ($2\pi R1 = X \cdot T3$ and $2\pi R2 = X2 \cdot T3$).

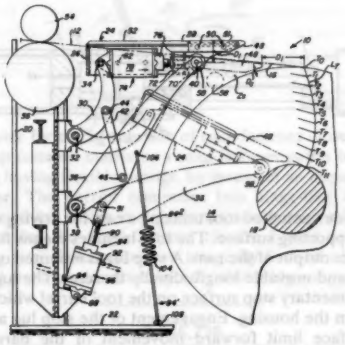


3,746,229

STRIP UNCOILING DEVICE

Raymond L. Feller, Bethel Park, and David W. Franklin, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,342
Int. Cl. B21c 47/18
U.S. Cl. 226—91 **14 Claims**



A strip uncoiling device for a strip formed in a coil and having a separated portion. The separated portion defines with a point of tangency thereof with the coil and the coil itself a separation zone. The coil is mounted on a mandrel in a predetermined position.

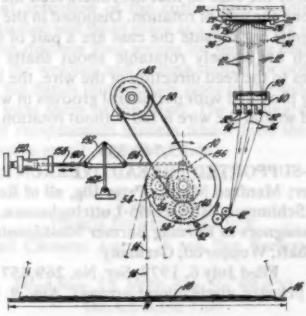
The strip uncoiling device adjacent predetermined position continuously peels the separated portion from the coil during the uncoiling operation, and has a frame. A movable threading table is disposed adjacent the frame and has a delivery end portion and a separation zone portion. A first lever member is pivoted on the frame and on the delivery end portion. A second lever member is pivoted on the frame and on the separation zone portion. A link member pivotally connects the first lever member and the second lever member. Peeling means are on the movable threading table, are insertable into the separation zone and receive the separated portion thereon. Positioning means are slidably mounted on the movable threading table adjacent the separation zone portion a predetermined distance from the peeling means away from the separated portion and are engageable with the coil adjacent the separation zone to maintain clearance between the peeling means and the coil thereby preventing the peeling means from marring the coil.

3,746,230

APPARATUS FOR ADVANCING STRAND

Robert J. Gelin, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 27, 1971, Ser. No. 212,417
Int. Cl. B65h 17/24
U.S. Cl. 226—168 **21 Claims**



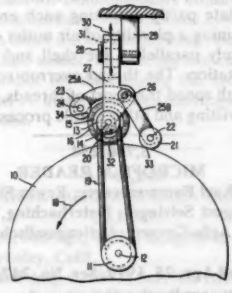
Apparatus for advancing one or more strands including a rotatable wheel for pulling strand having a periphery for strand engagement, primary means for strand removal from the periphery during rotation of the wheel and secondary means for strand removal spaced from the primary means in a position to effect strand removal upon failure of the primary means to effect complete strand removal.

3,746,231

AUTOMATIC WEAR COMPENSATING MECHANISM

Eddy Humberto Del Rio, Palm Beach Gardens, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 20, 1972, Ser. No. 245,860
Int. Cl. B65h 17/22
U.S. Cl. 226—177 **7 Claims**



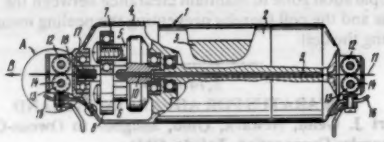
A mechanism for automatically compensating for wear of a roller element which is to be properly positioned juxtaposed to a reference element, whereby the gap between the roller element and the reference element is maintained substantially constant.

3,746,232

DEVICE FOR FEEDING WELDING WIRE OR ELECTRODES

Vladimir Ivanovich Kirillov, ulitsa Krasnopresnenskaya 25, and Alexei Vasilievich Batyrev, prospekt imeni Lenina 179, kv. 134, both of Volgograd, U.S.S.R.

Filed July 8, 1971, Ser. No. 160,817
Int. Cl. B65h 17/20
U.S. Cl. 226—187 3 Claims



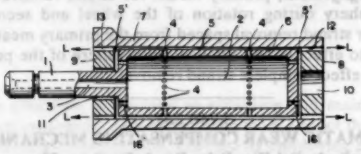
A device for feeding welding wire or wire electrodes into a welding zone comprising a rotatable cage mounted in a housing, the cage supporting rollers inclined at an angle to the axis of rotation of the cage so that the rollers feed the wire longitudinally along the axis of rotation. Disposed in the housing at its opposite ends but outside the case are a pair of spring-loaded rolls which are loosely rotatable about shafts extending at right angles to the feed direction of the wire, the spring-loaded rolls being provided with peripheral grooves in which the wire is received so that the wire is fed without rotation.

3,746,233

AIR-SUPPORTED THREAD OVERRUN ROLLER

Karl Bauer; Manfred Mayer; Peter Illg, all of Remscheid, and Bernd Schimmel, Remscheid-Luttringhausen, all of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed July 6, 1972, Ser. No. 269,457
Claims priority, application Germany, Aug. 9, 1971, P 21 34 247.2
Int. Cl. B65h 17/20
U.S. Cl. 226—194 6 Claims



In textile apparatus, an air-supported thread overrun roller of tubular shell construction rotatably carried on a hollow shaft segment of enlarged diameter having radial openings to direct compressed air into a small annular bearing gap, thereby providing an air-cushioned bearing for the shell, an annular face plate partly enclosing each end of the tubular shell and containing a plurality of air outlet channels extending approximately parallel to the shell and obliquely to the shell axis of rotation. The thread overrun roller is especially useful in the high speed transport of threads, yarns or the like in stretching, twisting and other textile processing operations.

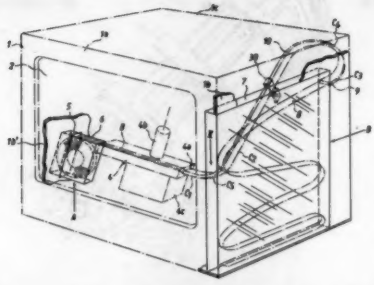
3,746,234

MICROFILM READER

Klaus Mischo; Karl Bammesberger; Erwin Fischer, all of Munich, and August Seizinger, Unterhaching, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 25, 1972, Ser. No. 247,272
Claims priority, application Germany, Apr. 27, 1971, P 21 20 685.9
Int. Cl. B65h 23/04
U.S. Cl. 226—196 16 Claims

A microfilm reader wherein the housing defines a first chamber for a cassette containing a supply of microfilm and a second chamber for storage of loose loops of microfilm. A motor-driven feeding mechanism serves to draw microfilm from the cassette and to introduce successive increments of microfilm into the inlet of an elongated guide wherein the microfilm advances toward the second chamber. The first chamber is parallel with the front wall and the second chamber is parallel with the rear wall or with a side wall of the housing. The guide defines a narrow channel which has at least two portions located in mutually inclined planes and one or more additional portions wherein the microfilm is twisted on its way into the second chamber. The guide consists of one or more flexible elastic carriers for a series of crosspieces each of which defines a part of the channel and is provided with integral or rotary guide elements for the marginal portions of microfilm.

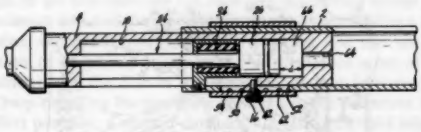


3,746,235

POWER CONTROL FOR POWDER-ACTUATED TOOL

Robert W. Crabtree, Jr., Rochester, N.Y., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 12, 1972, Ser. No. 217,307
Int. Cl. B25c 1/14
U.S. Cl. 227—10 2 Claims



A powder-actuated tool utilizing a ram for driving a fastener into a supporting surface. The tool includes means for varying the power output of the ram. A stop lug is mounted on the tool housing and movable longitudinally thereon. The lug engages a complimentary stop surface on the tool barrel which is slidable within the housing. Engagement of the stop lug and barrel stop surface limit forward movement of the barrel which movement is operative to return the ram from a driven position to a driving position.

3,746,236

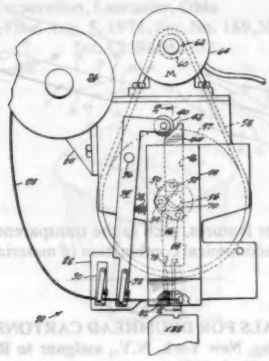
BOTTOM STOP MACHINE

Morris Perlman, Brooklyn, N.Y., assignor to Carbide Form Grinding, Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 693,592, Dec. 26, 1967, abandoned. This application Apr. 1, 1970, Ser. No. 24,551
Int. Cl. B27f 7/12
U.S. Cl. 227—88 6 Claims

A machine for automatically manufacturing slide fastener bottom stops from a continuous band of wire, and subsequently securing each bottom stop to a slide fastener chain.

The machine includes a mechanism for intermittently feeding a gapped continuous slide fastener chain and the wire band



between an anvil and press mechanism that forms the bottom stops and secures them to the slide fastener chain.

3,746,237

DEVICE FOR THE CONNECTION OF SNAP FASTENER CLOSURE HALVES OVER A SECURING RING HAVING BENDABLE PRONGS ON A CARRIER

Bernhard Nysten, Aachen, Germany, assignor to Firma William Prym-Werke K.G., Stolberg/Rhineland, Germany

Filed July 16, 1971, Ser. No. 163,149

Claims priority, application Germany, July 17, 1970, G 70 26 930.6

Int. Cl. B25c 7/00

U.S. Cl. 227—147 9 Claims

A device for the connection of snap fastener closure halves, as a snap fastener matrix or a snap fastener patrix by a securing ring having flexible prongs, by means of an impact tool on a carrier. The carrier comprises two hinge-like connected holdable plates, which in alignment towards each other having receivers for the snap fastener closure halves and for the securing ring. Both plates are integrally formed of synthetic material and are connected by a flexible bridge of material.

3,746,238

WELDING AND CUTTING APPARATUS

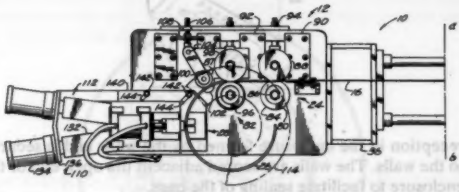
Robert E. Sprague, Chagrin Falls, Ohio, assignor to The F. C. Thornton Co., Cleveland, Ohio

Filed Oct. 5, 1971, Ser. No. 186,644

Int. Cl. B23k 5/00

U.S. Cl. 228—9 6 Claims

The specification and drawings disclose an improved cutting and welding apparatus particularly suited for forming metal closure bands of the type used on shipping drums and the like. The apparatus shown comprises a forming unit adapted to take a flat metal band and form it into a ring having a generally U-shaped cross-section. The forming assembly includes cooperating rolls which are shaped and positioned to simultaneously form the cross-section and deflect the band into the required circular configuration. Associated with the forming means is an assembly which includes a pair of welding heads positioned to engage the formed band at closely spaced points and a cutting member which is positioned between the welding heads and adapted to sever the band following a welding operation. The welding heads are mounted for reciprocation and include means responsive to movement of the band for actuating the heads. The means for controlling the unit include sensors which stop the forming operation at a precise



point so that actuation of the cutting and welding heads is closely controlled and takes place at a single work station. The drawings also disclose feed means for feeding end connector members to the welding and cutting station for positioning on the ends of the bands immediately prior to the welding operation which joins them to the band. The feeding means comprise simple reciprocated feeders which feed the connector members from a gravity-type feed slide.

3,746,239

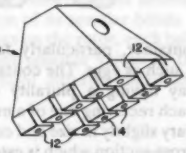
DESOLDERING DEVICE

Didier Henri Clement Auray, 4 rue Des Tartres, Rueil 92, France

Filed Nov. 12, 1970, Ser. No. 88,873

Int. Cl. B23k 1/00

U.S. Cl. 228—19 4 Claims



A device for desoldering one or more soldered connections wherein a heat conductive head member is provided with several projections for simultaneously contacting and melting each soldered connection. The soldered connections are isolated from each other during the melting operation to prevent any flow of melted solder, and means are carried by the heat conductive member for discharging the melted solder from the connections. A method of desoldering one or more soldered connections.

3,746,240

FOLDED CARDBOARD SPECIMEN CONTAINER OR URINAL

Jerome R. Flynn, Moraga, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

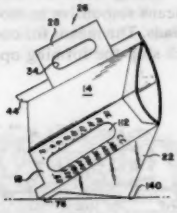
Filed Aug. 5, 1971, Ser. No. 169,232

Int. Cl. B65d 5/40, 5/60

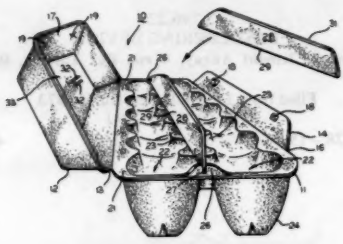
U.S. Cl. 229—14 B 13 Claims

The collapsible, disposable urine container is formed from a unitary blank having hingedly connected walls adapted to form an open ended enclosure. Bottom panels hingedly connected to the walls close one end of the enclosure and auto-

matically lock together to maintain the container in the erected state. A flexible, liquid impervious bag is mounted for reception in the enclosure formed by the walls and is secured to the walls. The walls are scored adjacent the open end of the enclosure to facilitate sealing of the bags.



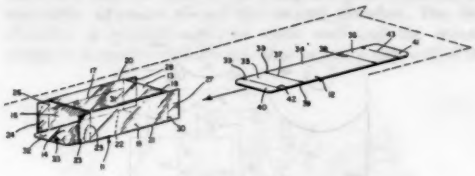
3,746,241
MOULDED CONTAINER
Paul R. Seymour, Downington, Pa., assignor to Container Corporation of America, Chicago, Ill.
Filed May 12, 1971, Ser. No. 142,508
Int. Cl. B65d *25/08, 85/32*
U.S. Cl. 229—15 **4 Claims**



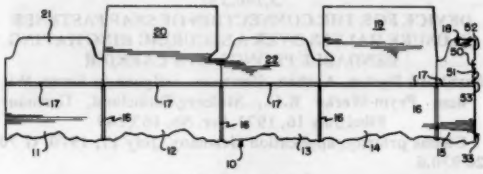
A moulded container, particularly for the packaging of frangible articles, such as eggs. The container is characterized by a covered tray having a plurality of cup-shaped cells formed therein, each receiving one of a number of similar articles, which may vary slightly in size and contour, but each having a transverse cross-section which is essentially circular. The cells in a longitudinal row are separated by vertical webs extending transversely of the long dimension of the carton. The longitudinal rows of eggs are effectively separated from each other by a detachable longitudinal partition divider located in position by structure at the tray deck, the divider extending upward from the plane of the tray deck and in contact with the underside of the cover, which is hinged to a tray side. The vertical partition divider is so positioned to give good stacking strength to the loaded container to protect the tops of the eggs, and is readily removable to facilitate removal of the individual eggs as needed.

3,746,242
COMBINATION FOLDED CONTAINER
John S. Troth, Wilmington, Del., assignor to Pamark, Inc., Montchanin, Del.
Filed June 9, 1971, Ser. No. 151,229
Int. Cl. B65d *11/20, 13/00*
U.S. Cl. 229—23 R **11 Claims**

A folded container is provided, which is a combination of at least two separate pieces, one of which is of folded sheet plastic or like construction, and the other of which is of paperboard or like construction. The sheet plastic portion is folded essentially into a sleeve, and the paperboard portion is folded to close at least one end of the sleeve and to form a tuck flap. The combination enjoys the ease of printability of paper, along with other features, such as the transparency of plastic, and is a highly economical combination of materials.

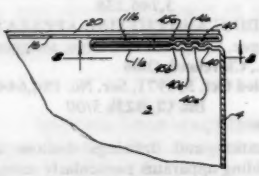


3,746,243
SEALS FOR DRUMHEAD CARTONS
Chauncey Young, New York, N.Y., assignor to Rexham Corporation, New York, N.Y.
Filed Jan. 24, 1972, Ser. No. 220,225
Int. Cl. B65d *5/02, 5/12*
U.S. Cl. 229—37 R **4 Claims**



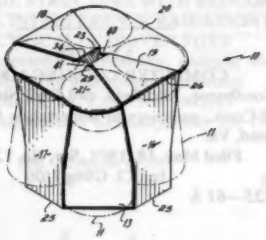
This disclosure is directed to an improved method of construction of drumhead type cartons (i.e., parallelepiped cartons whose ends are sealed by independent, taut membranes). A portion of the glue flap in the manufacturer's joint is extended beyond the end edges and is provided with a special edge configuration (e.g., sawtooth or non-straight edge) to provide a transverse dam or dams at the region of the manufacturer's joint to which the membrane is tightly adhered. Absolute tightness at the joint maybe further enhanced by simultaneosuly cross-crushing and cross-sealing the membrane and underlying special edge portions by a specially configured sealing platen.

3,746,244
SIFT-PROOF CARTON CONSTRUCTION
Frank D. Bergstein, Cincinnati, Ohio, assignor to The Bergstein Packaging Trust, Middletown, Ohio
Filed Dec. 29, 1971, Ser. No. 213,416
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 R **12 Claims**



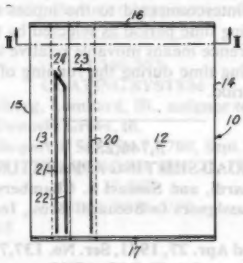
An improved sift-proof carton construction wherein a plurality of the carton end closure flaps are provided with mating sets of ridges or grooves which interengage when the flaps are juxtaposed to provide barriers acting to prevent the sifting and leakage of powdered granular materials from between the end closure flaps.

3,746,245
CARTON LOCK
Richard K. Oglesbee, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed Aug. 5, 1971, Ser. No. 169,355
Int. Cl. B65d 5/02
U.S. Cl. 229—40 3 Claims



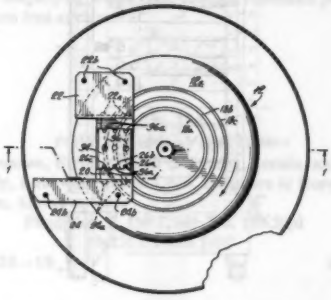
An improved carton lock includes a locking aperture located in the carton bottom and tabs with locking ears for insertion into the aperture. The locking aperture is defined by notches cut in edges of two opposing bottom panels, which edges are joined, and the locking ears are provided on the ends of two tabs associated with opposing locking panels. The carton is assembled from an appropriately cut blank and may be provided with dividers which cooperate with the locking ears to improve the security of the lock.

3,746,246
VALVE BAG
Charles Robertson Murray, Toronto, Ontario, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada
Filed Dec. 22, 1971, Ser. No. 210,835
Int. Cl. B65d 31/14
U.S. Cl. 229—62.5 5 Claims



A valve bag comprising a back wall and a front wall made of first and second panels partially overlapping each other, said front and back walls being joined along their entire periphery, the first panel having at least two plies and the second panel projecting between the plies of said first panel, and a transverse seal at a distance from the top end of the bag uniting the two panels in their common area of overlap and defining between said second panel and the plies of the first panel a tubular self-closing opening extending transversely of the bag adjacent the top thereof, said panels in their common area of overlap being also united along at least one line extending from the transverse seal to the bottom of the bag, said tubular opening being of such diameter and being so located transversely of the bag as to allow insertion therethrough of a filling spout and free delivery of filling material from said spout.

3,746,247
ULTRACENTRIFUGE WITH ROTOR SPEED IDENTIFICATION
John Camilliere, Bloomingdale, N.J., assignor to Electro-Nucleonics, Inc., Essex County, N.J.
Filed Dec. 23, 1970, Ser. No. 100,850
Int. Cl. B01d 21/26
U.S. Cl. 233—1 B 8 Claims

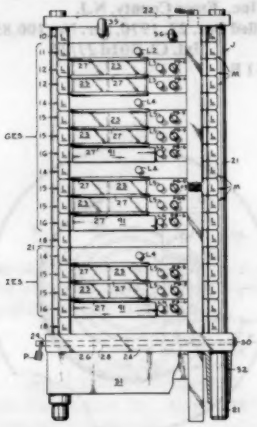


Provisions are made for electronically identifying the maximum allowable speed of an ultracentrifuge rotor for the purpose of supplying the identification information to a rotor overspeed control to prevent spinning a rotor beyond its designed top speed. The top surface of the rotor carries a number of annular bands which may be either black or white. The color of the annular band in each band position is detected by means of an electronic circuit including a light source, a photocell detector, and a transistor switch for each band. Each transistor switch conducts when the annular band from which it receives reflected light is black, but does not conduct when the annular band is white. Each conducting switch puts out a steady voltage signal of different amplitude. The voltage output signals of the transistor switches are added to generate an analog control signal identifying the rotor by the color combination of its annular bands. If there are three annular band positions on the rotor, each being either black or white, there are eight possible values of the analog control signal representing eight different maximum allowable rotor speeds.

3,746,248
VOTING MACHINE
Roy A. Martin, 809 Wellesley Drive N.W., and Clarence E. Pittman, 2479 Peachtree Road N.E., both of Atlanta, Ga.
Division of Ser. No. 755,688, Aug. 27, 1968. This application Apr. 28, 1972, Ser. No. 248,755
Int. Cl. G07c 13/00
U.S. Cl. 235—51 3 Claims

Apparatus for selectively producing electrical pulses representative of a particular selection made by the operator of the apparatus. The apparatus is disclosed in the form of a voting machine built up of modular components which fit together to form any of a plurality of different voting arrangements. The voting machine is substantially tamper-proof and has the following basic components: an input module, a frame assembly, a first control module, a first vote module, a second control module, a second vote module, a terminal module, a write-in module, a slave input module, and a third control module. The modules may be placed together in selected fashion to define a voting machine for voting in any type of political race and which will prevent overvoting. The different modules fit together in such manner that they cannot be separated without a key to unlock the same, thereby reducing

the possibility of tampering with the election results. Moreover, each module is constructed in such manner that



the module may be checked prior to assembly of the voting machine to insure proper functioning of the module once it is assembled.

3,746,249

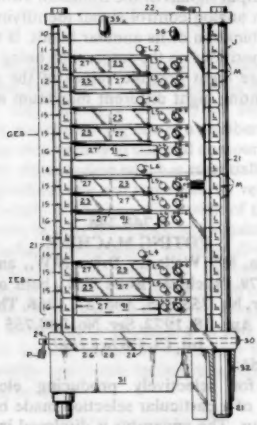
VOTING MACHINE

Roy A. Martin, 809 Wellesley Drive, and Clarence E. Pittman, 2479 Peachtree Road, both of Atlanta, Ga.

Division of Ser. No. 755,688, Aug. 27, 1968. This application Apr. 28, 1972, Ser. No. 248,551

Int. Cl. G07c *13/00*

U.S. Cl. 235—54 F **3 Claims**



Apparatus for selectively producing electrical pulses representative of a particular selection made by the operator of the apparatus. The apparatus is disclosed in the form of a voting machine built up of modular components which fit together to form any of a plurality of different voting arrangements. The voting machine is substantially tamper-proof and has the following basic components: an input module, a frame assembly, a first control module, a first vote module, a second control module, a second vote module, a terminal module, a write-in module, a slave input module, and a third control module. The modules may be placed together in selected fashion to define a voting machine for voting in any type of political race and which will prevent overvoting. The different modules fit together in such manner that they cannot be separated without a key to unlock the same, thereby reducing the possibility of tampering with the election results. Moreover, each module is constructed in such manner that the module may be checked prior to assembly of the voting machine to insure proper functioning of the module once it is assembled.

3,746,250

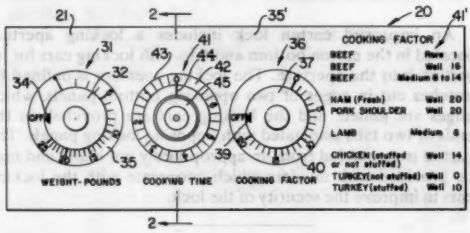
COMPUTER COOKING MEANS

Carl J. Goodhouse, Litchfield, and Emil Niemand, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 18, 1971, Ser. No. 125,743

Int. Cl. G06g *1/00*

U.S. Cl. 235—61 A **15 Claims**



A computer-controller device for controlling the cooking operation of a cooking apparatus, the device having a manually settable weight input for indicating a single selected indicated weight applicable to all meat items and corresponding to the weight of a particular meat item to be cooked. The device has a second manually settable input for indicating a selected variable other than the weight of the meat. The device has a timer that has a time period output operatively associated with the inputs to provide as an output a cooking time period for the particular meat item computed as a function of both of the inputs. The timer has a time period setting indicator operatively interconnected to the inputs to indicate the computed cooking time period as selected by the inputs. The timer has a reference means movable relative to the indicator to indicate lapsing time during the running of the computed cooking time period.

3,746,251

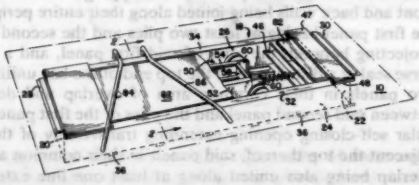
LOAD SHIFTING APPARATUS

Donald A. Bernardi, and Samuel S. Chambers, both of Harrisburg, Pa., assignors to Bernardi Bros., Inc., Harrisburg, Pa.

Filed Apr. 27, 1971, Ser. No. 137,777

Int. Cl. B65g *67/02*

U.S. Cl. 238—4 **1 Claim**



Apparatus for laterally transposing a load relative to its path of travel, such as a motor vehicle, including a plate disposed atop a transversely movable carriage which is biased to a cen-

tral position for simultaneously receiving laterally adjacent wheels of the load, and outwardly divergent guide rails which extend across the plate to engage the load such that the load is laterally transposed to a preselected position as it moves across the plate.

3,746,252

MODEL RAIL STRUCTURE WITH REDUCED ELECTRICAL INTERFERENCE RADIATION FOR ELECTRICALLY DRIVEN TOYS

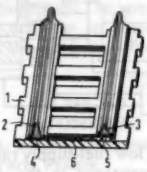
Rudolf Schaller, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 2, 1972, Ser. No. 249,497

Claims priority, application Germany, May 13, 1971, P 21 23 775.2

Int. Cl. A63h *19/30*

U.S. Cl. 238—10 E **12 Claims**



A model rail structure, producing low electrical interference radiation in use, for electrically driven track-powered toys such as model race cars, trains, and the like, having at least two current-conducting rail elements, a pair of longitudinally extending cooperable capacitor electrodes disposed in opposed relation, and a dielectric layer operatively disposed between said capacitor electrodes, with at least one of said rail elements being conductively connected to one of the capacitor electrodes and another of said rail elements being conductively connected to the other of the electrodes with the capacitor thus formed having a capacitance distributed relatively uniformly along the rail structure, the electrodes of the capacitor preferably having a configuration corresponding to that of the associated rail structure whereby the capacitor does not conflict with the natural appearnace thereof.

3,746,253

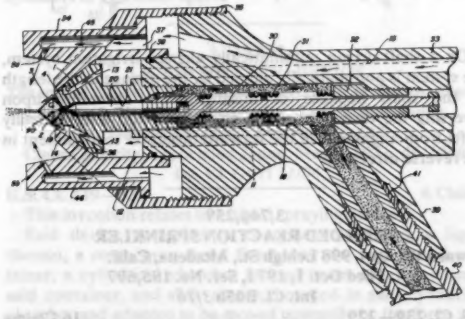
COATING SYSTEM

Arvid Carl Walberg, Lombard, Ill., assignor to Arvid C. Walberg & Co., Downers Grove, Ill.

Continuation-in-part of Ser. No. 73,700, Sept. 21, 1970, Pat. No. 3,692,241. This application Apr. 27, 1971, Ser. No. 137,847

Int. Cl. B05b *5/02*

U.S. Cl. 239—15 **52 Claims**



An atomization of coating material is accomplished by ejecting coating material through the orifice of the nozzle forcing it to flow across a forward facing diverging surface to the edge of an annular conical air orifice which directs air to an intersecting point forward of the nozzle orifice and thereby atomizes the coating material as it reached the annular edge of the air orifice. This type of atomization is used for conventional spray guns and for electrostatic spray guns with either completely electrically non-conductive forward ends for use with conductive coating materials such as water based coatings or with conductive fluid tips for use with either conductive or non-conductive coating materials. The forms of the invention employing water base coating materials provide an air pollution free system.

3,746,254

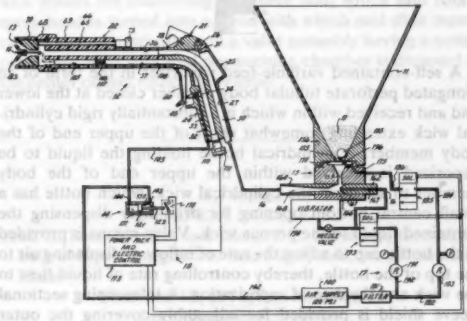
POWDER SPRAY SYSTEM

Lane S. Duncan, Elyria; Simon Z. Tamny, Lorain, and Charles H. Riedy, Lakewood, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Nov. 2, 1971, Ser. No. 194,830

Int. Cl. B05b *5/00*

U.S. Cl. 239—15 **41 Claims**



An electrostatic spray system for applying a solid particulate powder material to the surface of an article or substrate. The system includes a pneumatic conveyer line including a vacuum region for withdrawing powder from a hopper and entraining it in an air stream, after which it is propelled to an electrostatic spray gun while entrained in the air stream. To facilitate quick color or powder changes, the system includes an improved hopper having a check valve in the bottom which automatically closes when the hopper is removed from a supporting base and which is automatically opened when the hopper is placed upon the base. The system also includes a quick change hose connection at the handle of the gun for clamping and unclamping new hoses which extend between the hopper support and the electrostatic gun. To meter and control the rate of flow of powder from the hopper, the system includes a pneumatic metering control in the form of a variable air curtain injected into a powder flow passage located between the bottom of the hopper and the pneumatic conveyer line. As the pressure in this curtain is increased the flow in the system is reduced. The system also includes a pneumatic vibrator which is connected to a source of air pressure through a regulator common with the pneumatic conveyer so that the rate of vibration is always directly proportional to air flow in the pneumatic conveyer and to the vacuum in the conveyer which controls powder flow from the hopper. The electrostatic gun of this system has an adjustment for varying the shape of the spray pattern emerging from the gun while separating the flow of powder from the flow of entrainment air. The adjustment is so constructed that the size and dimensions of the discharge orifice of the gun are maintained fixed throughout the range of adjustment.

3,746,255

VARIABLE FEED VAPORIZING DIFFUSER

Bernard Surloff, 1040 E. 33rd St., North Miami Beach, Fla.

Filed Oct. 27, 1969, Ser. No. 869,692
Int. Cl. A24f 25/00; A61l 9/04
U.S. Cl. 239—51.5 10 Claims

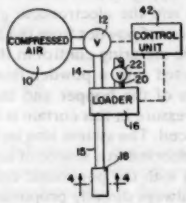
A self-contained variable-feed vaporizer in the form of an elongated perforate tubular body member closed at the lower end and received within which is a substantially rigid cylindrical wick extending somewhat short of the upper end of the body member. A cylindrical bottle holding the liquid to be vaporized is received within the upper end of the body member to set upon the cylindrical wick, which bottle has a small central bottom opening for drippingly dispensing the contained liquid to the porous wick. Valve means is provided in the bottle cap to adjust the rate of inflow of displacing air to the top of the bottle, thereby controlling rate of liquid flow to the wick and the rate of vaporization. A telescoping sectional sleeve shield is provided for adjustably covering the outer periphery of the cylindrical wick for additionally controlling rate of vaporization and diffusion.

3,746,256

APPARATUS FOR PRODUCING A PULSE OF LIQUID FOR MACHINING OPERATIONS

James M. Hall, Gaithersburg, Md., and Louis L. Clipp, McLean, Va., assignors to Exotech Incorporated, Gaithersburg, Md.

Filed Apr. 19, 1971, Ser. No. 135,233
Int. Cl. B05b 1/08
U.S. Cl. 239—101 13 Claims



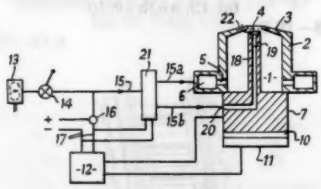
Apparatus for producing a high velocity jet pulse of liquid suitable for cutting or fracturing such materials as rock, metal, concrete and wood. A barrel is provided with a bore that intersects a rotatable valve which in a first position receives a liquid or gel charge and which in a second position is colinear with the barrel bore. Compressed gas expells the charge from the barrel through a nozzle to form a pulsed jet of liquid. Means can be provided for positioning the nozzle adjacent an extrusion as it issues from an extruder, permitting on-line cutting of the extrusion and for rotating the nozzle about a horizontal axis to permit operation at the optimum angle of cut.

3,746,257

FUEL-INJECTION SYSTEMS, MORE PARTICULARLY FOR LIQUID-FUEL BURNERS

Michael John Broad, Enfield, Middlesex, and Norman Moss, Ilford, Essex, both of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed June 21, 1971, Ser. No. 155,092
Int. Cl. B05b 3/14
U.S. Cl. 239—102 4 Claims



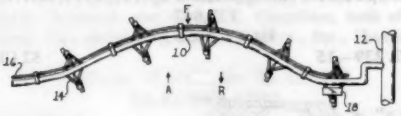
In order to obtain at low fuel-supply rates the benefit of ultrasonic atomisation assistance in the case of a swirl-type atomiser nozzle, the small-diameter horn of an ultrasonic vibrator extends axially through the swirl chamber of a swirl atomiser into close vicinity of the final outlet orifice of the conical end portion of the chamber so thatthe active tip of the horn can atomise the fuel as the fuel passes through the orifice while the horn is cleared by the hollow core of the swirl when the fuel-supply rate is sufficeint to ensure swirl atomisation. A pressure-sensitive switch then preferably cuts off the energisation of the oscillator for the ultrasonic transducer. A change-over valve controlled by the pressure-sensitive switch may be employed for diverting at low flow rates the fuel flow so that instead of entering the swirl chamber the fuel flows through an axial bore of the atomiser horn.

3,746,258

SHAFT-DRIVEN AUTOMATICALLY ALIGNED IRRIGATION SYSTEM

Rufus J. Purtell, P.O. Box 1152, Brownfield, Tex.

Filed July 3, 1972, Ser. No. 268,601
Int. Cl. B05b 3/18, 15/00
U.S. Cl. 239—212 3 Claims



On a shaft-driven automatically aligned irrigation system, the system is automatically aligned by the change in the length of the shaft because of misalignment. Therefore upon reversing the direction of the shaft, the shaft automatically shifts from alignment in the forward direction to alignment in the reverse direction.

3,746,259

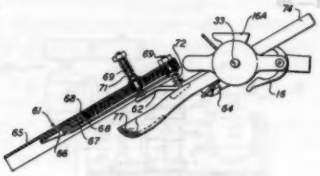
SHIELDED REACTION SPRINKLER

Edward W. Apri, 998 Lehigh St., Altadena, Calif.

Filed Oct. 1, 1971, Ser. No. 185,697
Int. Cl. B05b 3/16
U.S. Cl. 239—229 16 Claims

A sprinkler or lawn spray of the reaction type has a flexible shield cooperating with a guide channel to direct the water

emerging from the jet of the spray body in the desired direction and dispersal pattern. The shield may be of a flexible material or may be flexibly mounted to either the reaction arm or the spray body to preclude droplet distribution in a



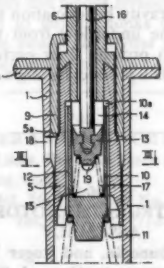
direction normal to the emerging stream from the spray jet. The shield is mounted either to the reaction arm or to the oscillating body of the spray. The stream guide channel may be open or closed and has an emerging reaction surface against which the jet stream impinges.

3,746,260

ATOMIZERS

Michel Boris, Paris, France, assignor to Societe Technique de Pulverisation, Paris, France

Filed Apr. 10, 1972, Ser. No. 242,518
Claims priority, application France, Apr. 8, 1971, 7113220
Int. Cl. B05b 9/04
U.S. Cl. 239—321 **7 Claims**



A liquid atomizer comprises a first cylinder containing a hollow, first piston, an atomizing nozzle communicating with the hollow piston a second cylinder of smaller cross-section than the first and communicating therewith. A second piston is slidable in the second cylinder and valve means connected to the second piston serve to block communication between the hollow piston and the nozzle. First and second springs are provided which respectively bias the valve means to close off the communication with the nozzle and lie between the two cylinders to bias them apart.

3,746,261

LIQUID SPRAYING DEVICE

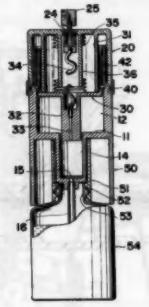
Takamitsu Nozawa, and Takao Kishi, both of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed May 5, 1972, Ser. No. 250,612
Claims priority, application Japan, May 8, 1971, 46/30685
Int. Cl. G01f 11/06
U.S. Cl. 239—333 **6 Claims**

This invention relates to a liquid spraying device.

Said device comprises a container containing a liquid therein, a rotay spray head fitted over the top of said container, a cylindrical chamber formed in an upper portion of said container, and slide means mounted in said cylindrical chamber and adapted to be moved upwardly by the force with which spray head is turned and moved downwardly by the biasing force of a restoring spring.

Said device is characterized in that said container being provided therein with a liquid pressurizing chamber, a suction line depending from said liquid pressurizing chamber and a liquid tank storing a liquid therein and having said suction line extending thereinto, said slide means is formed on its side wall



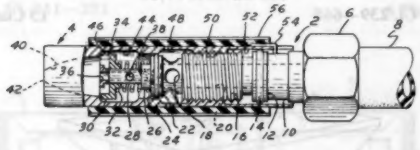
with means for converting the force with which said rotary spray head is turned into a force with which said slide means can be moved upwardly, and a valve assembly having a nozzle communicating with said pressurizing chamber is disposed in the center of said rotary spray head.

3,746,262

SPRAY NOZZLE

John U. Bete, Marion, and Richard C. Burnham, Greenfield, both of Mass., assignors to Bete Fog Nozzle, Inc., Greenfield, Mass.

Filed Oct. 12, 1971, Ser. No. 188,535
Int. Cl. B05b 1/32, 1/34
U.S. Cl. 239—458 **6 Claims**



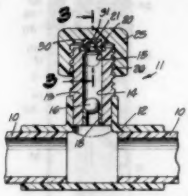
A spray nozzle having a barrel or sleeve with a bowl-shaped discharge passage and jet stream orifice at its fore end, and a stem threaded in the sleeve for relative longitudinal movement and forming therewith a shut-off valve with an outlet chamber leading to the discharge passage. In the outlet chamber a longitudinally adjustable stem fore end portion is provided on which a cup-shaped member with angularly slotted passages in its sidewall is slidably mounted and resiliently urged against an enlarged head of the fore end. The stem fore end also has an internal passage to direct an axial stream forwardly of the cup. When the stem and sleeve are moved to close said shut-off valve, the cup is seated in covering relation to the discharge chamber, and when moved to a fully open position of the valve the cup is carried into spaced relation to the discharge chamber, said cup movement from closed to full open position progressively changing the spray pattern from a full cone fogging mist to a solid jet stream.

3,746,263

WEEPER ASSEMBLY AND METHOD FOR USE IN A SLOW DIFFUSION TYPE IRRIGATION SYSTEM

Wilbur C. Reeder, 1961 Midwick Drive, Altadena, Calif., and Norman D. Batterson, 3870 Shadow Grove Road, Pasadena, Calif.

Filed Apr. 5, 1971, Ser. No. 131,355
Int. Cl. F16k 15/04
U.S. Cl. 239—542 23 Claims



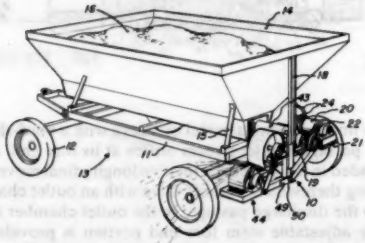
A weeper assembly and method for use in a slow diffusion type irrigation system comprising a tubular housing insertable at intervals along a water supply line and having a captive valve therein movable between a plurality of seats including a sub-atmospheric pressure seat and a super-atmospheric pressure seat limiting flow to a desired seepage rate adequate to support plant life within a restricted area. The second seat may be detachably supported at the outlet end of the assembly in different positions to provide flow at different rates, each of said positions being sufficiently close to the fixed seat that the valve seats thereon and cuts off all flow when the second seat is either loosely assembled or fully detached. The second seat is readily replaceable by a sprinkler head having means for supporting the valve off its fixed seat so long as the sprinkler head is in assembled position.

3,746,264

BELT FERTILIZER SPREADER

Robert G. Diener, Morgentown; Randall C. Reeder, Kenna, both of W. Va., and Harold D. Shoemaker, Uniontown, Pa., assignors to Waycrosse, Inc., Minneapolis, Minn.

Filed Nov. 30, 1971, Ser. No. 203,146
Int. Cl. A01c 17/00
U.S. Cl. 239—668 13 Claims



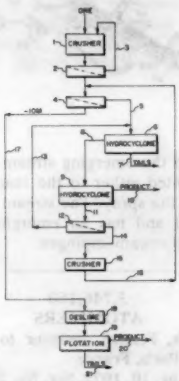
An improved fertilizer spreader having an improved fertilizer projecting means including a pair of pulleys, an endless belt, and a hold down wheel disposed between the pulleys and engaging said belt for imparting inertial movement to the fertilizer particles propelling them outwardly from the spreader, and an improved deflector means having a plurality of deflector fingers disposed at various angles and positioned to intersect the propelled stream of fertilizer particles and deflect portions of the stream in different directions.

3,746,265

BENEFICIATION OF POTASH

William B. Dancy, Lakeland, Fla., assignor to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Oct. 2, 1970, Ser. No. 77,637
Int. Cl. B03b 7/00
U.S. Cl. 241—20 11 Claims



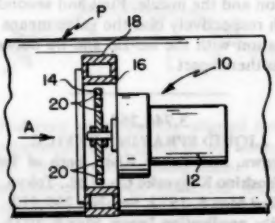
Potash is subjected to a rougher gravity beneficiation to remove significant amounts of halite and the overflow is subjected to a cleaner gravity beneficiation to provide an overflow concentrate. The underflow from the cleaner gravity separation is sized to provide finer particles which can be beneficiated to provide a product having a high K_2O content.

3,746,266

WASTE DISINTEGRATOR ROTOR AND RING ASSEMBLY

Raymond E. Knox, Dunedin, and Roger W. Teague, Largo, both of Fla., assignors to General Signal Corporation, Rochester, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,795
Int. Cl. B02c 18/40; B24d 7/04
U.S. Cl. 241—46 R 7 Claims



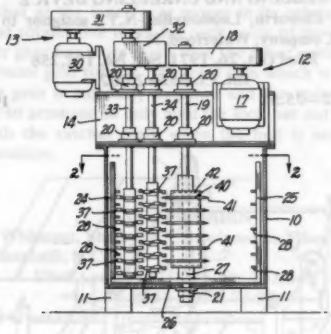
There is disclosed in this application a grinding rotor. The rotor comprises alternate layers of epoxy resin and abrasive grit and is reinforced with metal wire and fiberglass strands. The particular embodiment of the grinding rotor disclosed herein is adapted for use with waste disintegrators and is circumferentially surrounded by a ring which is also made of alternate layers of epoxy resin and abrasive grit. Reinforcing fiberglass strands are embedded in the ring to add rigidity.

3,746,267

HIGH VISCOSITY DISSOLVER

Claude K. Myers, and Gary A. Myers, both of 8376 Salt Lake Avenue, Bell, Calif.

Filed Aug. 26, 1971, Ser. No. 175,214
Int. Cl. B02c 13/18, 13/20, 18/10
U.S. Cl. 241—46.11 10 Claims



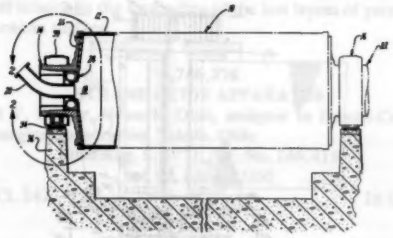
A dissolver for reducing blocks of material such as bales of rubber, resin and plastic, to small particle size, particularly suitable for preparing high viscosity solutions and dry particle mixtures. A container with a low-speed sweep shaft driving one or more sweep cutter shafts having overlapping cutter blades, with the shafts and blades arranged to provide a barrier in the container to larger chunks of material. Variable speed drives for the sweep and cutter shafts for controlling shaft speeds and directions of rotation.

3,746,268

TRUNION LINER AND SEAL FOR ROTARY MILLS

Arthur Kastrinos, Lima, Peru, assignor to Marcona Corporation, San Francisco, Calif.

Filed Oct. 26, 1971, Ser. No. 192,024
Int. Cl. B02c 17/18
U.S. Cl. 241—179 10 Claims



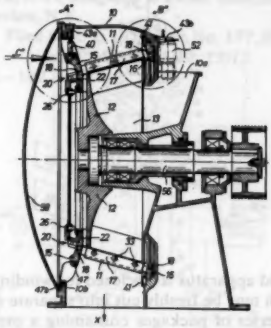
Apparatus of the ball or tube mill type for reducing and pulverizing material. A hollow shell containing the material to be reduced, such as ore, is rotatably supported by means of end positioned trunnions. Infeed material is introduced into the shell by means of a flexible feed spout extending through an opening in one of the trunnions. A trunnion liner and seal comprising an inflatable tire mounted on a wheel rim is positioned around the feed spout in the trunnion opening. The tire is inflated to expand its outer periphery into deformable sealing relationship with the inner surface of the trunnion.

3,746,269

APPARATUS FOR CUTTING PRE-COMMINUTED MATERIAL INTO CHIPS

Gerhard Maier, 11 Fichtestrasse, 4812 Brackwede, Germany

Filed May 24, 1971, Ser. No. 146,038
Claims priority, application Austria, June 26, 1970, 5782
Int. Cl. B02c 13/06
U.S. Cl. 241—244 9 Claims



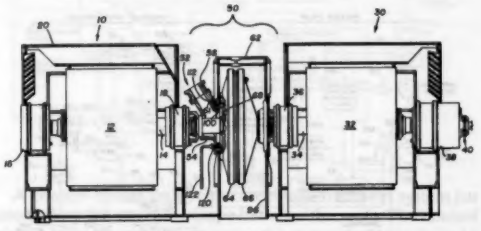
Apparatus for cutting pre-comminuted material into chips. The apparatus includes an outer normally stationary cage which carries a plurality of normally stationary blade assemblies which circumferentially surround a rotor which carries rotary blades to coact with normally stationary blades of the cage. The several normally stationary blade assemblies which are carried by the cage can all be simultaneously locked or unlocked. When unlocked they can be individually removed in order to be selectively replaced. However, it is also possible to remove all of the normally stationary blade assemblies simultaneously when a ring of the cage is unlocked from a housing of the apparatus.

3,746,270

DOUBLE-REVOLVING DISC REFINER

Robert D. Moore, Sr., Danville, Va., assignor to United States Gypsum Company, Chicago, Ill.

Filed June 25, 1971, Ser. No. 156,723
Int. Cl. B02c 7/06
U.S. Cl. 241—251 6 Claims

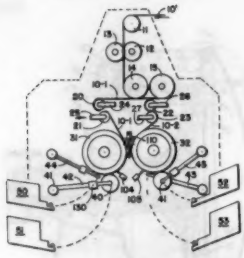


An improved double-revolving disc refiner wherein an annular shield member is attached to the input member of the refiner so as to project into the feed-end disc, thereby blocking off leakage paths around seals positioned at the joint of the input member and feed-end disc. Means are included for injecting a water phase into the clearance space between the shield member and the disc's seal, so as to force the water phase to flow downstream with respect to the stock flow through the joint, out of the clearance space and away from the joint.

3,746,271
WINDING PROCESS AND DEVICE FOR ONE OR MORE STRIPS OF FLEXIBLE MATERIAL

Sydney Frankel, 318 Briarcliffe Road, West Englewood, N.J.

Filed Oct. 7, 1971, Ser. No. 187,294
Int. Cl. B65h *19/26, 35/02*
U.S. Cl. 242—56 R 11 Claims

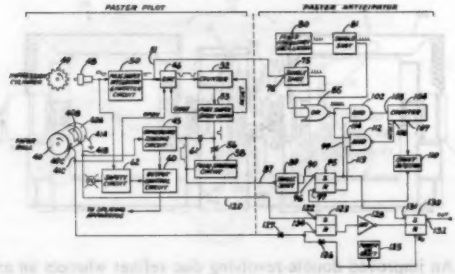


A process and apparatus is disclosed for winding a continuous web (which may be freshly cut into separate strips or ribbons) into a series of packages containing a predetermined length of web or ribbon under any desired tensioning conditions without interrupting the tensioning or flow of the web or ribbons when the material is cut so that a filled core can be removed and a new core started. The tension on the web or ribbons is regulated by fluid pressure applied to guide rolls which are movable to a position for propulsion to a winding core by one or the other of a pair of rotating drums. Before cutting the web or ribbons to complete a wound package and start a new package, the web or ribbons passing over one of the drums are moved so that said web or ribbons touch both said drums; the web or ribbon being cut while crossing from one drum to the other and the new free end of the web or ribbon being attached to the drum with which it just has come into contact to pass to a new empty core associated with this drum.

3,746,272
PASTER ANTICIPATE CIRCUIT

Carmen J. Rotolo, Hillside, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Oct. 12, 1970, Ser. No. 79,911
Int. Cl. B65h *19/08, 19/18*
U.S. Cl. 242—58.3 7 Claims

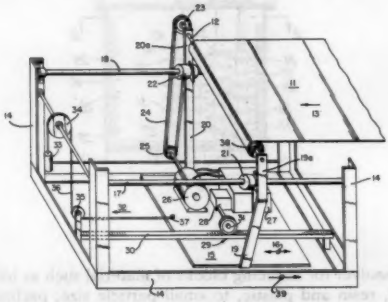


A digital control system for use with web fed printing presses or the like in which a new roll must be spliced to an expiring roll when the diameter of the expiring roll reaches a predetermined minimum and in which preliminary operations must be performed on the new roll in anticipation of the splicing operation. Disclosed is a method and apparatus for generating a signal to indicate that a predetermined period of time exists in advance of the start of preliminary operations, said period of time, once established, always remaining the same irrespective of the speed at which the web is running. Alternatively, the apparatus and method disclosed may provide an indication that a fixed period of time exists before the actual splicing operation.

3,746,273
REELING AND UNREELING DEVICE

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 26, 1971, Ser. No. 192,256
Int. Cl. B65h *25/02*
U.S. Cl. 242—75.51 10 Claims

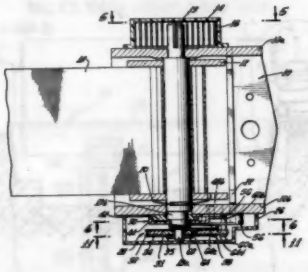


The disclosure relates to a device for reeling and unreeling a web or filiment under constant tension. The reeling mandrel is mounted on a sliding frame which is positively biased. The mandrel is driven by an electric motor mounted on the frame and any movement of the frame varies the rotational speed of the motor, whereby the speed of the motor is reduced as the diameter of the roll increases. This assures a constant tension on the web as it is reeled or unreeled.

3,746,274
STOP SENSITIVE RETRACTOR

Elmer Chen-Sheng Yang, Anaheim, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Feb. 17, 1971, Ser. No. 116,092
Int. Cl. A62b *35/00*
U.S. Cl. 242—107.4 31 Claims



A seat belt reel urged into wound position is prevented from unwinding by a lock bar engaging ratchet teeth formed on the reel. A reset cam on a speed reducing gear mechanism driven by the reel holds the lock bar away from the ratchet teeth when the belt is fully wound to permit initial unwinding of the belt. A pair of disks rotating with the reel are viscously connected to a disk pivotally mounted on the reel shaft, so that the pivotal disk is urged to rotate with the reel. A finger on the pivotal disk holds the lock bar out of engagement with the ratchet teeth during initial unwinding of the belt. Upon inter-

ruption of the unwinding movement, a spring urges the pivotal disk to pivot to release the lock bar and to cause the lock bar to engage the ratchet teeth so that further unwinding of the reel is prevented.

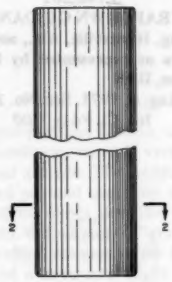
The reset gear mechanism includes an inner gear eccentrically mounted on the reel shaft and restrained from rotation so that it moves in an orbital path. An outer gear is provided with a ring of teeth surrounding the teeth of the inner gear and which are dimensioned to mesh with the teeth of the inner gear so that as the inner gear moves in its orbital path, the outer gear rotates one tooth for each cycle of the inner gear. The outer gear has more teeth than the inner, with the result that the outer gear rotates. The reset cam which is formed on the outer gear is angularly oriented and the speed reducing gears are so arranged to only hold the lock bar out of engagement with the ratchet teeth when the belt is near its fully wound position.

3,746,275

TEXTILE BOBBIN

John K. Whisnant, Shelby, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Apr. 9, 1971, Ser. No. 132,845
Int. Cl. B65h *75/10, 75/26*
U.S. Cl. 242—118.32 **5 Claims**



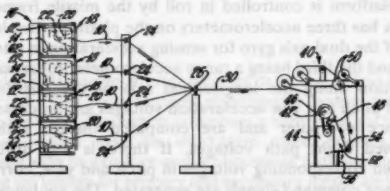
A textile bobbin for the winding of synthetic filament yarn is described, which bobbin comprises a cylindrical winding surface having a plurality of indentations superimposed upon the outer surface thereof in the form of parallel microgrooves, said grooves running the length of said surface substantially parallel to the axis of the cylindrical winding surface. The microgrooves provide a surface upon which filament yarn is more easily grasped initially in the beginning of a winding stage, and more particularly provides a substantially lower takeoff tension in the unwinding of the last layers of yarn from said bobbin surface.

3,746,276

STRAND GUIDE APPARATUS

David V. Stotler, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Aug. 5, 1971, Ser. No. 169,418
Int. Cl. B65h *55/00*
U.S. Cl. 242—129 **10 Claims**



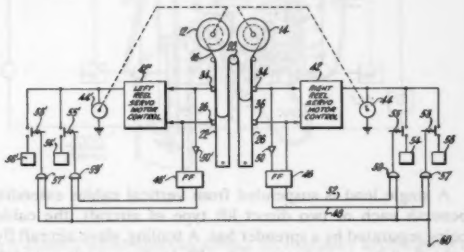
Apparatus for withdrawing strand from a wound package having a hollow central region from which strand can be withdrawn including a strand guide having an opening through which strand leaving the package can travel, in which a support for locating the strand guide with its opening interiorly of the package and means for withdrawing strand from the interior of the package through the opening is provided.

3,746,277

DRIBBLE CIRCUIT

Gunnar Richwell, Oslo, Norway, and Antonios I. Giouvalakis, Island Park, N.Y., assignors to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Sept. 2, 1971, Ser. No. 177,289
Int. Cl. G11b *15/58, 23/12*
U.S. Cl. 242—182 **1 Claim**



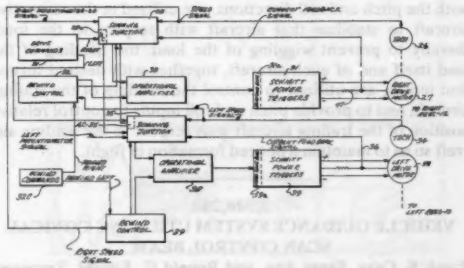
In a magnetic tape transport reel servo motor control circuit the magnitude of the holding current is selected as one of two possible magnitudes as a function of the position of the bight of the buffering tape loop with respect to sensors within an associated vacuum column.

3,746,278

TAPE TRANSPORT CONTROL SYSTEM

Paul A. Dennis, Hermosa Beach, and William A. Schrader, Mission Viejo, both of Calif., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed Sept. 7, 1971, Ser. No. 178,115
Int. Cl. B65h *23/20, 25/04;* **G11b** *15/46*
U.S. Cl. 242—190 **16 Claims**

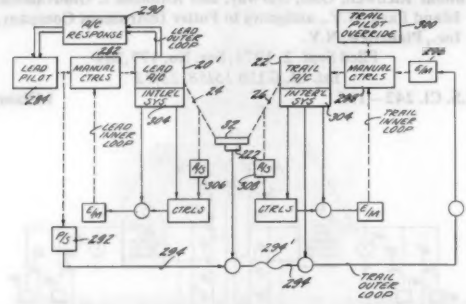


A control circuit for a reel-to-reel tape transport system for controlling the transfer of tape between the reels. The control circuit includes means for sensing the demand of tape during a tape transfer operation and providing an electrical signal corresponding thereto. The demand signal is summed with a feedback signal representative of the speed of the reel drive means, and a motor current feedback signal to provide a resultant output signal to an operational amplifier. The output signals from the operational amplifier control an isolated Schmitt power trigger for energizing and de-energizing the reel drive motor. The summing junction for the operational amplifier also includes an R-C anticipation circuit for smoothing out the high speed commands to the reel drive motors to smooth out the motor operation.

3,746,279
MULTI-LIFT AIRCRAFT CONTROL SYSTEM

Joseph R. Maciolek, Newtown, and John J. Wallace, Winsted, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 2, 1971, Ser. No. 168,219
Int. Cl. B64c *37/02, 11/44, 27/70*
U.S. Cl. 244—2 **12 Claims**



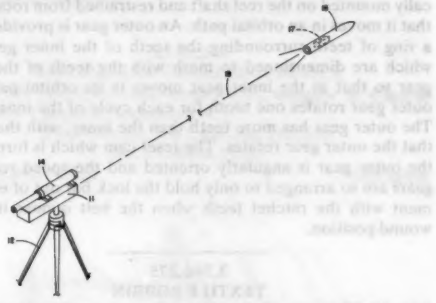
A single load is suspended from vertical cables extending beneath each of two direct lift type of aircraft, the cables being separated by a spreader bar. A trailing, slave aircraft flys behind, above, and to one side of a leading, master aircraft, with the spreader bar extending at an angle to the heading of the aircraft, in a plane below them. The lead pilot control provides overall, or outer loop control of the lead aircraft, and the controls of the lead aircraft are electromechanically coupled to operate the controls of the trailing aircraft, whereby the lead pilot controls the outer loop of both aircraft. The inner or stability loop of the controls of each aircraft are modified so as to utilize inputs from the inertial system of the related aircraft and inputs relating to the manner in which the load extends below the aircraft, to both stabilize the load with respect to each aircraft, and to maintain the trail aircraft in a proper position with respect to the lead aircraft and the load. Specifically, the cables from each aircraft supporting the spreader bar are maintained substantially perpendicular with respect to the spreader bar thereby to maintain substantially equal loading of each aircraft; pitch and roll inertial sensors in each aircraft, and the angle of each cable with respect to its aircraft in both the pitch and roll directions, are utilized in the respective aircraft to stabilize that aircraft with respect to the load, thereby to prevent wiggling of the load; the heading of the load itself and of each aircraft, together with desired formation inputs, are utilized to control the heading of the trailing aircraft, and to provide pitch and roll inputs to control relative position of the trailing aircraft with respect to the leading aircraft so as to maintain a desired formation in flight.

3,746,280
VEHICLE GUIDANCE SYSTEM UTILIZING CONICAL SCAN CONTROL BEAM

Frank S. Coxe, Santa Ana, and Ronald G. Eguchi, Torrance, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Jan. 28, 1972, Ser. No. 221,722
Int. Cl. F41g *7/00*
U.S. Cl. 244—3.13 **15 Claims**

A reference signal generated in a receiver on a vehicle to be controlled is phase locked with a reference signal generated in a transmitter at a control station, prior to separation of the vehicle from the station. A conically scanned electromagnetic guidance beam containing a boresight axis is radiated out from the station and is used to guide the vehicle along this boresight axis, the direction of the boresight axis from the station being positionable. This end result is achieved by means of the receiver on the vehicle which receives the electromagnetic signal generated by the transmitter and develops elevation and azimuth control signals whenever the vehicle deviates from a position centered along the boresight axis; such deviation being indicated by a phase difference between the conical

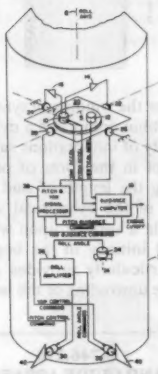


scanning modulation pattern of the received signal and the receiver reference signal. These control signals may be used to maintain the vehicle centered along the boresight axis.

3,746,281
HYBRID STRAPDOWN GUIDANCE SYSTEM

William W. Stripling, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 4, 1971, Ser. No. 168,883
Int. Cl. F41g *7/00*
U.S. Cl. 244—3.2 **3 Claims**



A guidance system for guiding a missile in its boost phase. The system uses a two-axis spaced-fixed platform with pitch and yaw gimbals controlled by a dual-axis gyro that is mounted on the platform. A single-axis roll gyro is strapped-down to the missile frame for controlling the missile in roll. The platform is controlled in roll by the missile frame. The system has three accelerometers on the platform, two being a part of the dual-axis gyro for sensing acceleration in pitch and yaw, and the third being a range accelerometer for sensing acceleration along the longitudinal axis of the missile. The sensed pitch and yaw acceleration voltages are processed in a guidance computer and are compared therein with programmed flight path voltages. If there is any difference between corresponding voltages in pitch and yaw, corrective guidance command signals are generated. The guidance command signals are fed to a pitch-and-yaw signal processor for processing. This processor provides as outputs command signals to airframe actuators for guiding the missile in pitch

and yaw. Output signals from the roll gyro are likewise applied, through a roll control signal processor, to the same airframe actuators for guiding the missile in roll. The pitch and vertical acceleration voltages are so processed in the guidance computer that an engine cut-off signal is generated at the proper time.

3,746,282

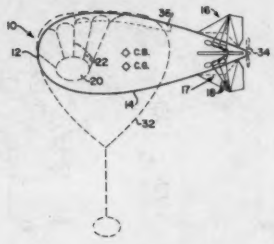
HIGH ALTITUDE STREAMLINED BALLOON

Jerome J. Vorachek, Barberton, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 3, 1971, Ser. No. 139,425

Int. Cl. B64b *1/58*

U.S. Cl. 244—31 **8 Claims**



A streamlined super-pressure balloon, in a substantially collapsed prelaunch condition, ascends vertically expanding to superpressure at float altitude. The weight distribution of the balloon envelope and payload maintains the center of gravity below the center of buoyancy and the changing geometric relationship between the center of gravity and center of buoyancy is such to effect rotation of the balloon from a vertical ascent attitude to a horizontal flight position at float altitude.

3,746,283

AIRCRAFT

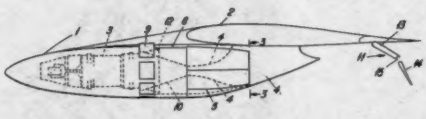
Alfred Arthur Morgan, St. Albans, Hertfordshire, England, assignor to Hawker Siddeley Aviation Limited, Surrey, England

Filed Aug. 18, 1971, Ser. No. 172,844

Claims priority, application Great Britain, Aug. 18, 1970, 39,794/70

Int. Cl. B64c *3/50*

U.S. Cl. 244—42 CB **7 Claims**



A blown flap on an aircraft receives its forced air/gas flow as unducted efflux from a power plant/ejector system mounted under the wing. The system comprises a number of gas turbine engines, which may be short-term rated engines, each disposed with its axis fore-and-aft housed in a streamlined pod having side doors for primary and secondary intake air and for discharging the efflux spanwise. A bullet or spreader body promotes departure of the efflux through the discharge doors and also provides a streamline tail for the pod.

3,746,284

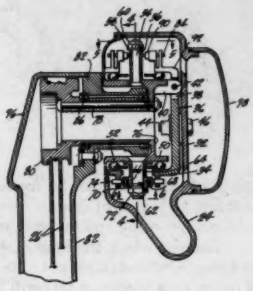
CONTROL WHEEL STEERING DEVICE

Alton E. Farr, Rolling Hills; Graydon L. Welch, Artesia, and Lorin A. Wood, Lakewood, all of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Nov. 3, 1971, Ser. No. 195,238

Int. Cl. B64c *13/04*

U.S. Cl. 244—83 E **5 Claims**



A control wheel steering device for manually applying override changes in aircraft attitude during autopilot control. Electrical signals fed to a flight guidance computer are varied by pilot pressure on a spring which deflects and in turn modulates an electronic transducer.

3,746,285

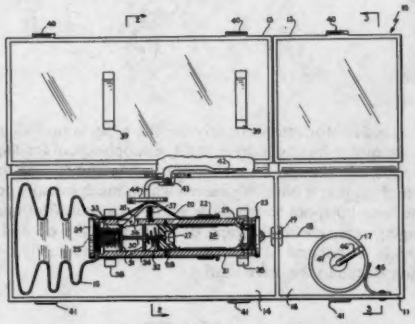
RESCUE BALLOON KIT

Juan Mango, 114 Eldorado St., Syracus, N.Y.

Filed Feb. 25, 1972, Ser. No. 229,388

Int. Cl. B64b *1/62*

U.S. Cl. 244—98 **2 Claims**



A folded inflatable balloon is secured in fixed position in a box having a hinged cover with snap-type latches. The balloon has a long neck and contains a tubular container carrying a lighter-than-air gas cartridge having a frangible end and spring biased cartridge puncturing means which are held in biased position by a latch lever which extends outward from the container inside the neck. A pivoted trigger lever extends along the outer surface of the box and has an enlarged inner end adapted to depress the latch lever when the outer end is swung away from the box filling the balloon, opening the cover, and releasing the balloon. A light line, secured to the container, is wound on a reel in the box for tethering the balloon.

3,746,286

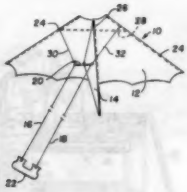
KITE STRUCTURE

Julius M. Christoffel, Houston, Tex., assignor to Gayla Industries, Inc., Houston, Tex.

Filed July 12, 1971, Ser. No. 161,513

Int. Cl. B64c *31/06*

U.S. Cl. 244—155 A **11 Claims**



A kite having a keel which can be manipulated from the ground while flying by a pair of lines to cause the kite to be controlled in its maneuvering and the lines may be connected to a control member on which the lines may be wound when the kite is not flying. This abstract is not to be construed in any way to define or limit the invention set forth below.

3,746,287

TAPE DRIVE SYSTEM

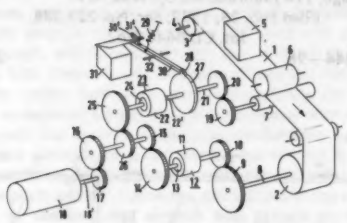
Manfred Rausch, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 28, 1970, Ser. No. 75,884

Claims priority, application Germany, Sept. 30, 1969, P 19 49 249.0

Int. Cl. G11b *15/29, 15/22*

U.S. Cl. 242—206 **9 Claims**



A system for intermittently driving a tap is provided with a drive motor having a drive shaft, a supply spool for supplying tape, a take-up spool capable of rotating and storing the tape, a first magnetic coupling means which mechanically connects the take-up spool to the drive shaft, a capstan frictionally engaging one side of the tape between the take-up and supply spools. A second magnetic coupling mechanically connects the capstan to the drive shaft.

3,746,288

SYSTEM FOR THE RADIO TRANSMISSION OF GUIDANCE SIGNALS TO SELF-PROPELLED BODIES

Hellmuth Schoneborn, Sauerlach, Oberbayern, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

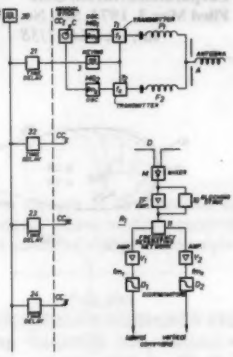
Filed Aug. 2, 1962, Ser. No. 214,425

Claims priority, application Germany, July 17, 1962, B 63852

Int. Cl. F41g *7/00, 11/00*; G05d *1/00*

U.S. Cl. 244—3.14 **3 Claims**

1. In a system for the radio transmission of guidance signals to a self-propelled body, in combination at least one control center, provided with two transmitters continuously transmitting two different carrier frequencies, a pulse stage connected to simultaneously modulate both transmitters, adjusting means at each control center for frequency modulating both said transmitters with independent frequencies, said adjusting means comprising a hand-operated control stick operable in accordance with the observed deviations of said body to be guided from the line of sight to its target, two filters connecting said transmitters to a single circularly polarizing wideband transmitting antenna both for transmitting the modulated carrier frequencies to the self-propelled body, said body



having a dipole antenna, connected with a mixing circuit with nonlinear characteristic to form an intermediate frequency from the two carrier frequencies received, an intermediate-frequency amplifier tuned to said intermediate-frequency, a demodulator with a frequency selector connected for obtaining and separating the modulation frequencies, one amplifier and one discriminator for each modulation frequency for determining the guidance signals represented by the modulation frequencies.

3,746,289

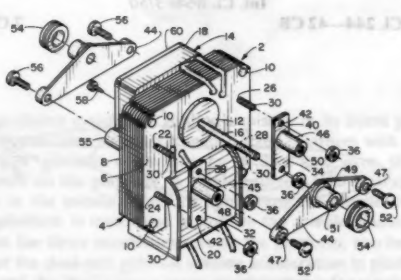
REFRIGERATOR FAN MOTOR

Eric C. Johnsen, Santa Monica, Calif., assignor to Gem Products, Inc., Santa Monica, Calif.

Filed June 29, 1971, Ser. No. 157,841

Int. Cl. G11b *17/00*

U.S. Cl. 248—14 **11 Claims**



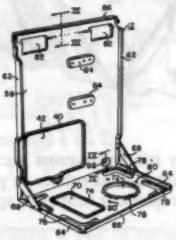
A refrigerator fan type motor being universally mountable and associable with a multiplicity of refrigerator models of various manufacturers which permits the use of one motor component through the use of specific motor design and construction in conjunction with mounting brackets, fixtures and the like.

3,746,290

WATER COOLER UNIT FRAME ASSEMBLY

Carl E. Sholtes, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 24, 1971, Ser. No. 117,927
Int. Cl. F16f 3/00
U.S. Cl. 248—15 2 Claims



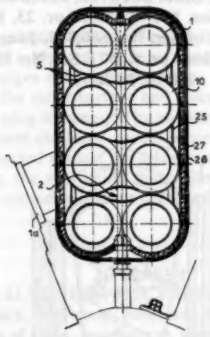
A water cooler is provided with a unitary, integral back and bottom plate frame of relatively thin material, with this integral plate having a configuration which permits the use of the thin material without extensive vibrations being transmitted from the operating parts of the water cooler to the room in which it is housed. The integral back and bottom plate frame includes an outwardly offset, laterally extending rib disposed at the top of the back portion and a pair of outwardly projecting truncated conical embossments adjacent the jointure of the back and bottom portions to space the water cooler unit from the wall on which it is disposed and also to limit to a great degree excessive vibrations from being passed to this wall.

3,746,291

SUPPORT FOR A NEST OF EXHAUST MANIFOLDS FOR INTERNAL COMBUSTION ENGINES

Karl Walter Kuhn, Saint-Germain-En-Laye, France, assignor to Societe D'Etudes De Machines Thermiques, Saint-Denis, France

Filed Sept. 24, 1971, Ser. No. 183,441
Claims priority, application France, Oct. 28, 1970, 7038887
Int. Cl. F16l 3/22
U.S. Cl. 248—68 R 11 Claims



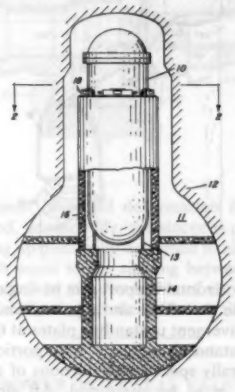
A support for a cluster of parallel exhaust manifolds for internal combustion engines, bearing upon the engine and comprising a vertical rod consisting of detachable elements each including one a portion of said rod and at least one flexible side arm arranged so that the adjacent arms of two successive elements are in mutual registering relation with respect to a plane extending transversely of said rod so as to hold tightly at least one exhaust manifold therebetween.

3,746,292

VESSELL STABILIZATION SYSTEM

Perfecto T. Anatalio, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed May 29, 1971, Ser. No. 147,871
Int. Cl. F16m 11/00
U.S. Cl. 248—154 2 Claims



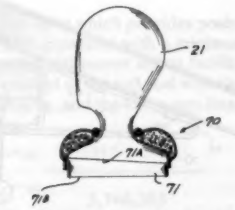
An arrangement for stabilizing a vertically supported elongated vessel including a system of resiliently supported yokes for engaging respective lugs fixed to the vessel.

3,746,293

BALLASTED WIG BLOCK AND/OR STAND FOR A WIG BLOCK

Loretta R. Silvia, 2209 North Avenue, Bridgeport, Conn.

Continuation-in-part of Ser. No. 110,130, Jan. 27, 1971. This application Apr. 23, 1971, Ser. No. 136,870
Int. Cl. A47g 29/08; F16n 11/02
U.S. Cl. 248—177 12 Claims



This disclosure is directed to a ballasted wig block and/or stand therefor to provide a stable support as a wig supported thereon is being worked on or styled. The ballasted wig block stand comprises a base member for supporting the wig block thereon. Connected to the base member is an upwardly extending collar which is arranged to be drawn tight above the reduced neck portion of the wig block to firmly seat the block in position on the base member within the collar. Either the collar and/or the base member is weighted by a ballast in the form of sand, liquid or a weighted substance, to provide the requisite stability for the wig block.

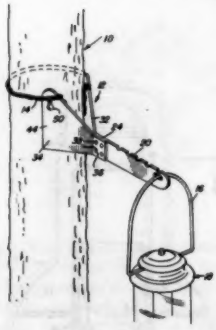
In another form of the invention the wig block may be internally formed with a hollow and ballasted by filling the hollow with a dense or heavy material.

3,746,294

LANTERN HANGER ASSEMBLY

Leroy I. Johnston, Rural Route 2, Lake Crystal, Minn.

Filed Oct. 1, 1971, Ser. No. 185,572
Int. Cl. F16m *13/02*
U.S. Cl. 248—221 **5 Claims**



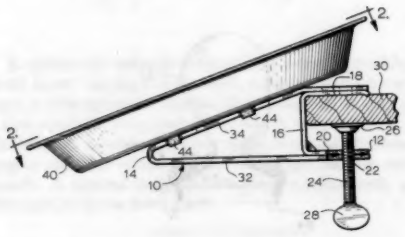
A generally horizontal support arm having one end for support of an article therefrom and a pair of endwise outwardly extending and divergent upstanding plates at the other end including free upstanding marginal edge portions for abutting remote peripherally spaced side portions of an upright from which the arm is to be supported. An elongated tension member is provided and has one end attached to one of the free marginal edge portions of one plate while the other end of the tension member is attached to the free marginal edge portion of the other plate so as to encircle and frictionally engage the side of the upright remote from the side thereof embraced between the upstanding plates.

3,746,295

MERCHANDISING FIXTURE

Frank E. Stepanek, La Grange Park, and Francis G. Winters, Crystal Lake, both of Ill., assignors to American Home Products Corporation, New York, N.Y.

Filed July 3, 1972, Ser. No. 268,441
Int. Cl. A47f *5/00*
U.S. Cl. 248—226 A **2 Claims**



A merchandising fixture for displaying a stack of articles has a clamp for attaching the fixture to the edge of a shelf and a support arm adapted to have attached thereto one of said articles to form a base for the stack thereof.

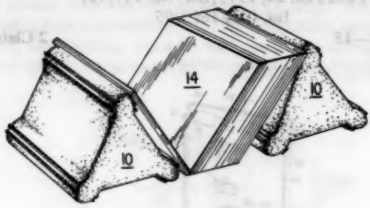
3,746,296

PORTABLE FORMS SUPPORT

Carl J. Dean, Southbridge, and David M. Wright, Shrewsbury, both of Mass., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Oct. 20, 1971, Ser. No. 191,009
Int. Cl. A47b *65/00*
U.S. Cl. 248—441 **6 Claims**

A portable support for retaining groups of business or data cards in an upright inclined manner, permitting their being conveniently inspected, "thumbed" through and otherwise handled as necessary for varied business purposes. The support is of generally triangular cross section, constructed of high friction material such as rubber or plastic, and provided with plural raised projections near each apex.

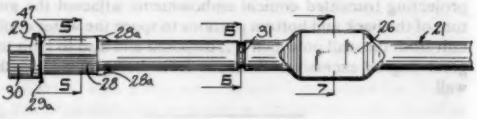


3,746,297

TIE ROD FOR CONCRETE FORMS

Ransom J. Daniels, Jr., 93 Brookhaven Drive, Glastonbury, Conn.

Filed May 10, 1971, Ser. No. 141,576
Int. Cl. E04g *17/06*
U.S. Cl. 249—40 **3 Claims**



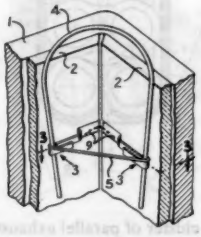
A tie rod for concrete forms which is formed from a length of wire and has defined adjacent opposite ends thereof latch-receiving portions of substantially square cross-section outwardly subtended by flanges of greater dimension than the diameter of the wire.

3,746,298

HOT TOPS WITH SPRING CLIP ENGAGING MEANS ON INNER SURFACES OF ABUTTING SLABS

George R. Witt, Post Office Box 8728, Lakewood, Ohio

Continuation of Ser. No. 723,410, Apr. 23, 1968, which is a continuation-in-part of Ser. No. 680,885, June 6, 1967, abandoned. This application Apr. 8, 1971, Ser. No. 132,588
Int. Cl. B22d *7/10*
U.S. Cl. 249—197 **4 Claims**



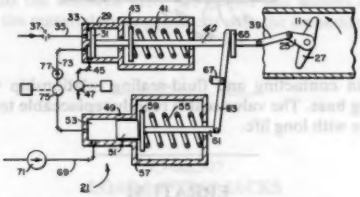
Hot tops of two or four thin slabs are described which are held in place by U-shaped spring clips, biasing opposite or adjacent slabs away from one another and serving to wedge the slabs tightly against the walls of the head box or ingot mould top.

3,746,299

QUICK OPERATING DEVICE FOR A VALVE

Ivor J. Lewis, Marple Woods, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 19, 1971, Ser. No. 163,582
Int. Cl. F16k *31/143*
U.S. Cl. 251—25 8 Claims



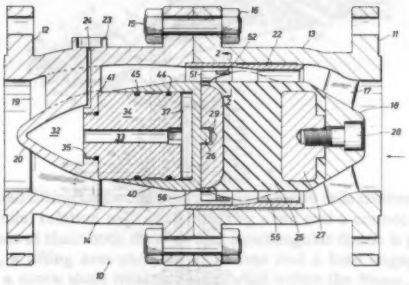
A mechanism utilizing a pair of cooperatively associated hydraulic cylinders and springs for absorbing and storing the energy produced by slowing down a large on-off type valve having a fast closing action as the valve approaches its closed position and releasing the energy to open the valve quickly.

3,746,300

FLOW REGULATOR

Robert H. Welker, Houston, Tex., assignor to Texsteam Corporation, Houston, Tex.

Filed May 5, 1971, Ser. No. 140,485
Int. Cl. F16k *31/12, 7/02*
U.S. Cl. 251—63.5 6 Claims



In a flow regulator for a pipeline or the like, an apparatus which includes a plug of resilient material. The plug is expanded and bulges on its outer surface to controllably limit flow between the outer surface and a surrounding passage or chamber. The plug is damaged by an extremely high flow rate. The improvement disclosed herein incorporates a plurality of ribs to be contacted against the downstream portion of the expandable plug, the ribs being tied together by an encircling ring. The ribs control and limit the shape of the plug as it expands.

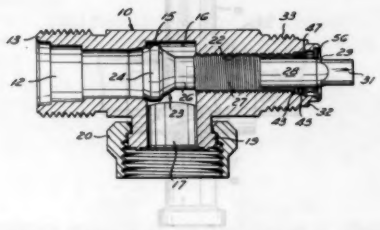
3,746,301

VALVE STEM FRICTION DEVICE

Tadeusz Budzich, Moreland Hills, and Frederick S. Browne, Euclid, both of Ohio, assignors to Weatherhead Co., Cleveland, Ohio

Division of Ser. No. 814,929, April 10, 1969, Pat. No. 3,602,340. This application Nov. 20, 1970, Ser. No. 91,233
Int. Cl. F16d *7/00*; F16k *41/04*
U.S. Cl. 251—64 6 Claims

A braking and locking structure for frictionally supporting a shaft, such as a valve stem, for axial and rotational movement in a housing comprising a cylindrical surface on the periphery of the shaft, a friction sleeve in frictional engagement with the cylindrical surface and axially located between abutment washers in the housing. The friction sleeve is plastically deformed in a radially outward direction for engagement with the cylindrical surface with a frictional force independent of the actual amount of radial deformation from its original nominal size and, additionally, the sleeve is provided with an axially extending lip plastically deformed to allow the sleeve to assume a length equal to the spacing between the abutment washers determined by the dimension of various components to eliminate axial lost motion of the friction sleeve.

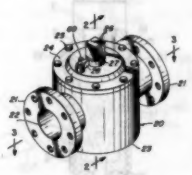


3,746,302

POWER DRIVE SEAL VALVE

James P. Larsen, 7026 E. Sunnyside Drive, Scottsdale, Ariz.

Continuation-in-part of Ser. No. 35,341, May 7, 1970, abandoned. This application Sept. 9, 1971, Ser. No. 178,903
Int. Cl. F16k *25/00*
U.S. Cl. 251—103 15 Claims



A field-oriented valve which provides positive and complete sealing against high pressures with a minimum of physical effort. Built-in mechanical power assists facilitate a perfect seal and there is no contact of the soft seal with the valve body during opening or closing, and the valve uses line pressure to open rather than close.

3,746,303

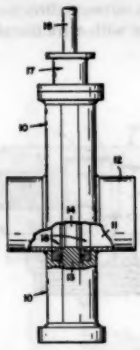
VALVE CONSTRUCTION AND METHOD

Marvin H. Grove, and Kee W. Kim, both of Houston, Tex., assignors to M & J Valve Company and M & J Development Company, Houston, Tex.

Continuation-in-part of Ser. Nos. 679,138, Oct. 30, 1967, abandoned, and Ser. No. 773,785, Nov. 6, 1968, abandoned. This application Mar. 9, 1970, Ser. No. 17,365
Int. Cl. F16k *25/00, 5/06*
U.S. Cl. 251—159 8 Claims

A valve (e.g., gate or ball) having a sealing assembly with one part made of material like nylon and a second part made of a more resilient material such as a synthetic rubber. The two parts are press fitted into an annular recess and provide finished sealing surfaces for engaging the valve working surface of a gate or other valve member. In one embodiment the more resilient material is disposed adjacent one peripheral

surface of the nylon. In another embodiment the more resilient material is disposed adjacent both inner and outer



peripheries of the nylon. Also a method of manufacture in which sealing surfaces are formed after the two parts have been pressed into the recess.

3,746,304

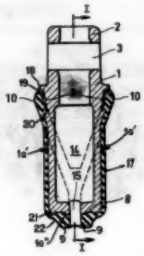
VALVE CONSTRUCTION

Karl Matthias, Viernheim/Hessen, Germany, assignor to Bopp and Reuther GmbH, Mannheim-Waldhof, Germany

Continuation of Ser. No. 748,028, July 26, 1968, abandoned. This application Feb. 26, 1971, Ser. No. 119,413

Int. Cl. F16k *3/12*

U.S. Cl. 251—327 **7 Claims**



A gate valve comprises a valve housing having an annular valve seat which surrounds a passage for flow of a fluid. A valve disc is received in the housing and is movable to and from a sealing position engaging the valve seat. The valve disc has a circumferentially extending sealing surface and an axially directed sealing surface. A sealing element is carried by the valve disc on the sealing surfaces thereof. It comprises a first portion extending along the circumferentially extending surface and a second portion extending along the axially directed surface. The surface area of the second portion is greater than the surface area of the first portion and both portions engage the valve seat when the valve disc is in sealing position, the first portion under radial pressure and the second portion under axial pressure of the fluid.

3,746,305

INTERCHANGEABLE VALVE SEAT ASSEMBLY

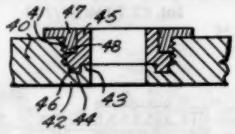
Jorge C. Faraon Chaul Zakka, Aveune Revolucion No. 1579, Mexico City, 20, Mexico

Filed Dec. 8, 1970, Ser. No. 96,049

Int. Cl. F16k *51/00*

U.S. Cl. 251—360 **8 Claims**

An interchangeable valve seat assembly for use with a variety of valves. A casing having a walled cavity therein is provided and a retaining base is formed integrally with the casing. An interchangeable and substantially annularly shaped valve seat is removably located within the cavity and is posi-



tioned in contacting and fluid-sealing relationship with the retaining base. The valve seat is readily replaceable to provide the valve with long life.

ERRATUM

For Class 251—145 see:
Patent No. 3,746,308

3,746,306

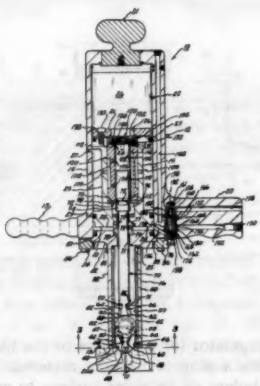
NAIL EXTRACTING DEVICE

Rollo G. Ellis, Charlotte, N.C., and Allan V. Ditty, Detroit, Mich., assignors to Gerald T. Gilleran, Detroit, Mich., a part interest

Continuation-in-part of Ser. No. 885,042, Dec. 15, 1969, Pat. No. 3,643,918. This application Feb. 16, 1972, Ser. No. 226,772

Int. Cl. B25c *11/00*; B66f *15/00*

U.S. Cl. 254—19 **22 Claims**



A nail extracting device including a housing having a pair of handles to permit the user thereof to manipulate the device. The housing has a generally cylindrically shaped power section with a tubular extension of a rectangular cross section extending from one end thereof. A piston reciprocally mounted within the cylindrical power section is responsive to fluid pressure selectively communicated to the opposite sides of the piston to drive the same to and away from the tubular extension. The wall of the piston facing the tubular extension carries the inner end of an impact member which extends from the power section into the tubular extension where it is adapted to drivingly engage a pair of pivotally mounted nail engaging jaws. The impact member and the jaws are so arranged that movement of the piston toward the tubular extension drives the nail engaging jaws toward an outer opening in the tubular extension into a clamping engagement with the head of an embedded nail. Movement of the piston away from the tubular extension withdraws the jaws into the tubular extension and permits withdrawal of the nail from the material in which it is embedded. The piston has therewithin a percussion

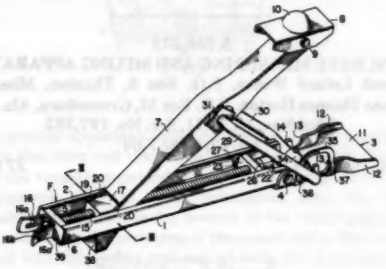
producing device operable to engage the inner end of the impact member to drive the jaws into the material to permit the jaws to clampingly engage the head of the embedded nail after the piston has driven the jaws toward the material. Valving means forming a part of the device are adapted to be manipulated by the operator of the device to selectively direct fluid pressure to the opposite sides of the piston to commence movement of the piston in the desired direction. The percussion producing device is automatically operable to drive the jaws into the material after the piston has moved the jaws toward the material for engagement with the embedded nail.

3,746,307

LOAD LIFTING JACKS

Shinichiro Yamazaki, Kariya, Aichi Pref., Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Aichi-Pref., Japan

Filed June 23, 1971, Ser. No. 155,736
Int. Cl. B66f *3/08, 3/36*
U.S. Cl. 254—126 **7 Claims**



A load lifting jack comprising a pair of guide rails connected in parallel relation with each other by a pin and a connecting member at their both ends so that a rectangular frame is provided, a lifting arm carrying at its one end a load engaging head, a screw shaft rotatably supported within the frame, the screw shaft carrying thereon an internally threaded nut to which the lifting arm is pivoted at its one end, link members pivoted at their one ends with respect to the lifting arm at an intermediate position thereof, a base on which the pair of guide rails is pivotally mounted by the said pin, the base having one or more pairs of aligned notches on its flanged portions with which said one ends of the link members are selectively engageable, and a linking or supporting member which rotatably supports the screw shaft at its one end and inside of the frame but bears the thrust of the screw shaft.

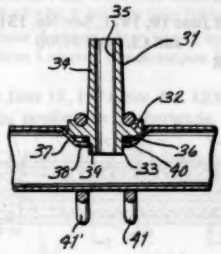
3,746,308

GAS MANIFOLD CONSTRUCTION

Oskar F. Vatterott, St. Louis, Mo., assignor to Vatterott & Glassl Tool & Mfg., Inc., St. Louis, Mo.

Filed Dec. 22, 1971, Ser. No. 210,948
Int. Cl. F16l *41/00*
U.S. Cl. 251—145 **8 Claims**

A gas manifold constructed of thin walled tubing adapted for socketing and punch pressing for securely accepting uniquely formed gas valves, nipples, and the like therein, so that the latter are maintained without resort to threading and



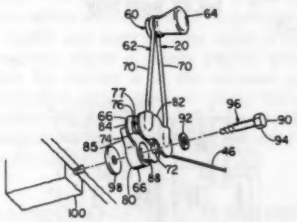
being adapted for presentation above, below, or aligned with the exterior surface of the tubing.

3,746,309

WINCH HAVING A SELECTABLE STABLE 'AT REST' UNBRAKED DRUM POSITION DURING EACH REVOLUTION

Raymond D. Johnson, 444 22nd Place, S.E., Vero Beach, Fla.

Filed Nov. 9, 1971, Ser. No. 197,028
Int. Cl. B66d *1/30*
U.S. Cl. 254—150 **14 Claims**



A winch designed for any duty capability from light to heavy duty has a sub assembly of a major axis shaft with bearings adapted to be secured to a supporting structure and in turn rotatably receive an elliptical drum means eccentrically offset from the major axis shaft. Then a lift line, wound on or unwound from the elliptical drum means during respective raising or lowering of a load, at two operational moments during each revolution is in lineal directional alignment through the center of the major axis shaft. Stopping of the actuating means used in turning the elliptical drum about the major axis shaft at these respective alignment operational moments results in the winch operation being stopped without braking or holding. One of the two alignment positions, with the load line positioned below the center of the major axis shaft is considered more stable than the other alignment position above the center of the major axis shaft.

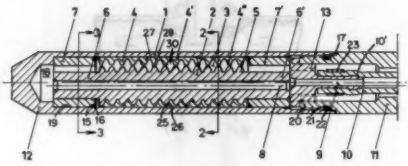
In a light weight embodiment, the winch is adaptable for many light duty lifting jobs. For example in a residential stairway, the winch is installed with pulleys, a strong cord and a pivotal support boom having hooks for suitcases which are raised above for inactive storage and are lowered when needed. In heavy duty embodiments, components of the winch are often made to serve two functions such as a crank arm structure also serving as a guiding flange of an offset eccentric lift line receiving elliptical drum.

3,746,310

VIBRATOR DRIVEN BY PRESSURIZED FLUID

Johnny Fransson, Smedbyvagen 84, S-184 00 Akersberga; Henrik Holmlund, Lidvagen 44, S-175 00 Jakobsberg, and Erik Kareby, Fiskebyvagen 10, S-122 47 Enskede, all of Sweden

Filed June 10, 1971, Ser. No. 151,669
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 R 10 Claims



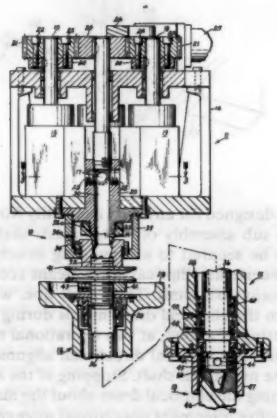
A vibrator is provided having an eccentric member enclosed in a housing and arranged to be set in motion in an eccentric and vibration-inducing rolling movement inside the housing, the eccentric member and the housing each being provided with intermeshing screw threads, the number of starts of the threads on the interior of the housing being one more than the number of starts in the threads on the exterior of the eccentric member.

3,746,311

MULTI-STAGE MIXING DEVICE

Robert C. Harper, Loveland; G. W. Creeden, Milford, and Victor G. Soukup, Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed June 20, 1972, Ser. No. 264,603
Int. Cl. B01f *7/08*
U.S. Cl. 259—7 9 Claims



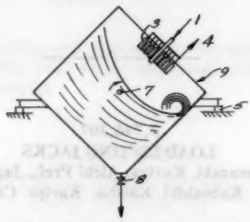
A mixing device having a plurality of mixing zones arranged in series, at least one of the mixing zones comprising a turbulent mixer of generally tubular conformation having a plurality of turning elements positioned therewithin and which is adapted to rotate as an entirety. At least one other mixing zone comprises a rotatable, shear mixing device incorporating a pair of relatively rotatable, cylindrical elements positioned one within the other and at least one of which has a helically disposed groove on a surface opposite the cooperating surface of the other cylindrical element. The serially arranged mixing sections provide improved mixing action to assure homogenity of the resulting mixture and the use of turbulent mixing as one section of the mixing device assures that the product will not be unduly overheated due to excessive shear mixing.

3,746,312

APPARATUS FOR THE HOMOGENIZATION AND MIXING OF NUCLEAR FUELS

Hans Pirk, Dornigheim; Fritz Ploger, Kleinostheim, and Horst Vietzke, Grossauheim, all of Germany, assignors to Nukem Nuklear-Chemie und-Metallurgie, GmbH, Wolfgang near Hanau am Main, Germany

Filed June 23, 1969, Ser. No. 835,508
Int. Cl. B01f *15/02*
U.S. Cl. 259—3 4 Claims



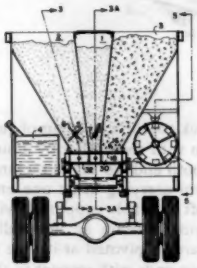
An apparatus for mixing and homogenizing U-235 or plutonium containing nuclear fuels is provided. It comprises a vertical, flat rectangular container which is either rotatable about a horizontal middle axis or is a fluidized bed. The apparatus has filter candles to separate exit gases from solids.

3,746,313

CONCRETE MEASURING AND MIXING APPARATUS

Raymond Leland Weeks, P.O. Box 8, Thaxton, Miss., and Alonzo Thomas Horton, P.O. Box M, Greensboro, Ala.

Filed Nov. 10, 1971, Ser. No. 197,292
Int. Cl. B28c *7/04*
U.S. Cl. 259—154 27 Claims



A concrete-mixing machine, detachably mounted on a standard truck frame, comprising: a water tank and chambers for storing and hauling dry-mix materials; a metering slide (FIGS. 1, 3 to 4B, 8, 12 and 12A), measuring desired amounts of cement, sand and gravel at the site of concrete use; a tumbling cylinder in which measured amounts of water are added; and a conveyor system for moving the dry-mix materials to the tumbler and the wet concrete out of the machine. One of the walls of each of the cement and sand compartments of the slide is movable for variation of the volume of the compartment, thus controlling the proportions of the dry-mix materials for concrete of varying strengths. The slide is power-reciprocated between compartment-inlet ports at the bottoms of the storage chambers and compartment-outlet openings in a relatively stationary plate below the slide, the inlets to the slide compartments being open and the compartment outlets closed in one extreme reciprocated position, and the inlets being closed while the outlets are open in the other extreme position. The amount of water used is controlled by varying the stroke of a pump. The conveyor system comprises a conveyor by which concrete materials are elevated to a point well above

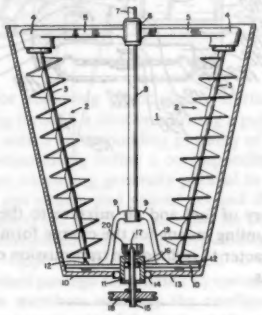
the truck frame — preferably, as indicated in FIG. 9, to a point above seven feet in height — for example, in pouring an 8-foot-high concrete wall. The belt which moves dry-mix materials from beneath the slide and chambers is protected from excessive wear by the apertured plate between it and the heavy load of dry-mix materials. Preferably all the moving parts of the apparatus are driven from the truck's auxiliary transmission.

3,746,314

APPARATUS FOR TREATING SUBSTANCES

Constant Johan Nauta, Overveen, Netherlands, assignor to Nautamix Patent A.G., Zug, Switzerland

Filed Jan. 4, 1971, Ser. No. 103,439
Int. Cl. B01f 7/08
U.S. Cl. 259—21 **11 Claims**



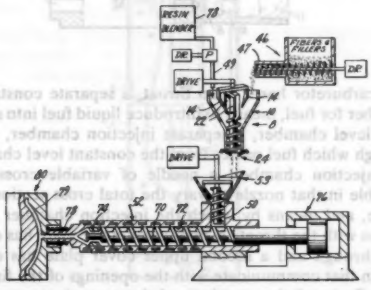
The present apparatus includes a vessel having at least one agitator that stirs and thereby agitates the contents. The bottom of the vessel is provided with a member adapted to agitate the contents and to inject substances into the vessel. Preferably the agitator in the bottom of the vessel generates a vortex motion in the contents of the vessel and a fluid may be injected into the vortex and mixed with the contents of the vessel.

3,746,315

MIXING AND TRANSPORTING DEVICE AND METHOD OF MIXING AND TRANSPORTING

Marc A. Rizzi, Orange, and James Cutarelli, Shelton, both of Conn., assignors to USM Corporation, Boston, Mass.

Filed Dec. 28, 1970, Ser. No. 101,749
Int. Cl. B01f 7/08
U.S. Cl. 259—21 **31 Claims**



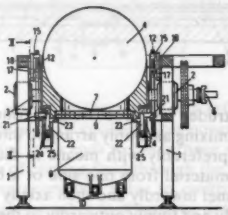
A device for mixing dry and liquid materials deposited in a hopper including blades rotated in the hopper and disposed to spread the materials on the wall of the hopper spirally to wet and initially mix the materials and to roll the mixture spirally along the wall for transport through an outlet. A method is also provided for mixing and/or transporting viscous material by spreading the material on a surface and/or rolling the material along the surface for discharge.

3,746,316

COUPLING MEANS FOR CONTAINERS SUCH AS TWO ROTATABLY MOUNTED DRUMS

Johannes Christiana Langen, Jan Van Cuykstraat 56, and Christianus Petrus Langen, Zandkampen 11, both of Cuyk, Netherlands

Filed June 15, 1971, Ser. No. 153,254
Claims priority, application Netherlands, June 16, 1970, 7008822
Int. Cl. B01f 9/02, 15/02; B65g 65/62
U.S. Cl. 259—57 **5 Claims**



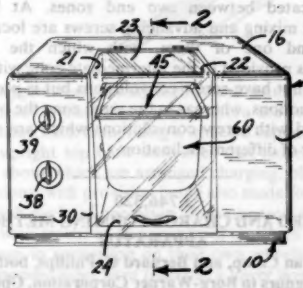
The present invention is directed to improvements in the coupling mechanism for connecting a rotatably mounted drum to a carrier used to convey a material to be processed in the drum to and from the drum. The coupling mechanism is adapted to connect the input opening of the drum and the discharge end of the carrier in a sealed relationship while simultaneously elevating the carrier so that it may be rotated with the drum. The coupling includes a pair of oppositely disposed slides which are mounted to reciprocate vertically to elevate the carrier and each of these slides is formed with a central passageway which is axially aligned with the axis of rotation when the carrier is in the elevated position. The clamping mechanism which serves to clamp the carrier to the drum is provided with a roller which rotates within the axially aligned passageway of the reciprocally mounted slides when the assembly is rotatably driven.

3,746,317

DOUGH KNEADING APPARATUS AND METHOD OF PRODUCING BAKED PRODUCTS

Peter H. Schroeder, Sr., Thief River Falls, Minn., assignor to Thorough-Bread Industries, Limited, Toronto, Ontario, Canada

Filed Apr. 7, 1971, Ser. No. 132,045
Int. Cl. B01f 7/02
U.S. Cl. 259—185 **4 Claims**



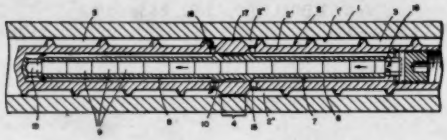
A kneading machine having an eccentrically mounted horizontal bar affixed to a motor for rotation and positioned in a resilient mixing bowl to provide a kneading, rather than mixing, action. The resilient bowl allows and aids the kneading action as the horizontal bar rotates eccentrically within the bowl.

3,746,318

SCREW EXTRUDER WITH INTERNAL STATIC MIXING ASSEMBLY

Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 16, 1971, Ser. No. 172,013
Claims priority, application Germany, Aug. 18, 1970, P 20 40 919.2
Int. Cl. B01f 7/08
U.S. Cl. 259—191 14 Claims



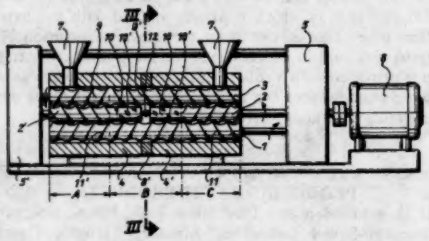
A screw extruder for processing thermoplastic materials having a static mixing assembly arranged internally of the conveying screw, preferably with means to direct a melt of the thermoplastic material from one side of a blocking means in the screw channel inwardly and then axially through the static mixing assembly and finally outwardly to the other side of said blocking means.

3,746,319

MIXING OF MATERIALS

Josef Blach, Sucystrasse 24, Bietigheim-Buch, Germany

Filed Oct. 22, 1971, Ser. No. 191,256
Claims priority, application Austria, Oct. 22, 1970, 9520/70
Int. Cl. B29b 1/10; B01f 7/08
U.S. Cl. 259—192 10 Claims



An apparatus for mixing and advancing pulverulent, viscous and/or fibrous materials comprises a housing provided with an elongated interior chamber wherein an intermediate mixing zone is located between two end zones. At least three cooperating mixing and advancing screws are located in this chamber and one of them, with which the other two cooperate, is provided in the intermediate zone with a surface which does not have screw convolutions but is provided with mixing projections, whereas in the same zone the other screws are provided with screw convolutions which are of different pitch and/or of different inclination.

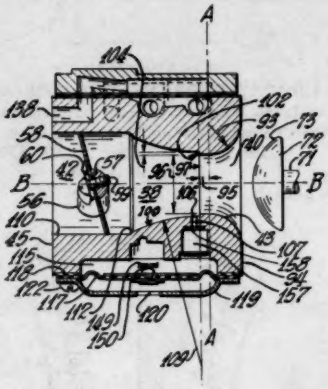
3,746,320

FUEL FEED AND CHARGE FORMING METHOD AND APPARATUS

Robert L. Van Camp, and Bernard C. Phillips, both of Toledo, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 14,781, Feb. 27, 1970, abandoned, which is a continuation of Ser. No. 742,679, July 5, 1968, abandoned. This application Mar. 2, 1972, Ser. No. 231,169
Int. Cl. F02m 17/04
U.S. Cl. 261—35 5 Claims

The disclosure embraces a fuel feed and charge forming method and apparatus wherein the apparatus is of comparatively small size particularly for use with chain saws and other motor driven tools to effect the reduction in weight. The charge forming apparatus embodies a Venturi construction of modified shape, providing a method of operation wherein high capacity delivery of fuel and air mixture to the engine is attained, the mounting means for the charge forming apparatus being of a character to reduce the transmission of engine heat to the apparatus.

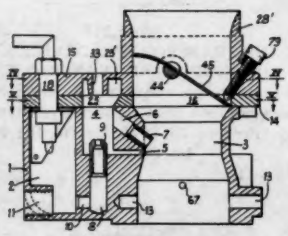


3,746,321

CARBURETOR

Jean-Marie Joseph De Pontac, 3 bis, rue du General Delanne, Neuilly (Hauts de Seine), France

Filed Aug. 5, 1971, Ser. No. 169,317
Claims priority, application France, June 30, 1971, 7123941
Int. Cl. F02m 1/10
U.S. Cl. 261—50 A 10 Claims



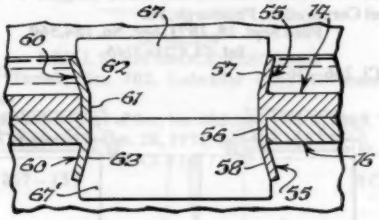
A carburetor has a main throat, a separate constant level chamber for fuel, means to introduce liquid fuel into said constant level chamber, a separate injection chamber, a nozzle through which fuel passes from the constant level chamber to the injection chamber, a needle of variable cross section movable in that nozzle to vary the total cross section of said nozzle, and means by which the injection chamber communicates with the throat. A first lower cover plate has openings therethrough and a second upper cover plate has openings therein that communicate with the openings of the first cover plate. Some of the openings of the second cover plate are disposed in and extend laterally of the lower face thereof. An atmospheric pressure corrector is carried by the upper plate to open and close one of those openings according to atmospheric pressure. A fuel richness corrector operates through one of the openings to adjust the richness of the fuel mixture. An air inlet to the throat is formed on the second plate, and a control shutter is rotatably mounted in that inlet.

3,746,322

GAS SCRUBBER

Alan B. Sawyer, North Tonawanda, N.Y., assignor to Andco Incorporated, Buffalo, N.Y.

Filed Jan. 3, 1972, Ser. No. 214,627
Int. Cl. B01f 3/04
U.S. Cl. 261—53 9 Claims



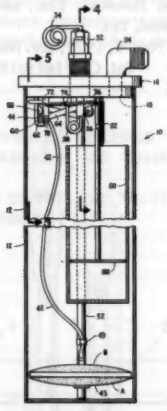
Apparatus for removing particulate material from a gas stream traveling through a duct comprising a pair of members each provided with a corresponding plurality of passages and arranged to cooperatively define a corresponding plurality of venturi passages extending generally parallel to the direction of flow of the gas stream and spaced around the axis of the duct. The members are relatively movable for varying the size of the venturi throats and for completely closing the passages when desired. Opposed sidewalls shaped to cooperatively define each venturi passage are carried by corresponding ones of the movable members whereby the configuration of the venturi passages is maintained throughout the entire range of adjustment. Liquid is supplied to the upstream member and the venturi inlets defined thereby are of a configuration effecting a substantially uniform distribution of the liquid to the passages.

3,746,323

DEVICE FOR MIXING GASES WITH LIQUID

Herman L. Buffington, 1100 Partridge Road, Spartanburg, S.C.

Filed Jan. 19, 1971, Ser. No. 107,758
Int. Cl. C02d 1/00
U.S. Cl. 261—122 3 Claims



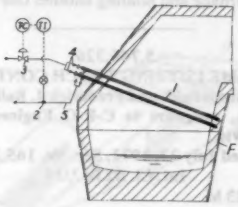
A device for mixing gases with a liquid carried in an elongated vertical vessel for creating a large mass of small bubbles which rise upwardly within the liquid to be absorbed thereby. The device can be readily disassembled for cleaning, and has a filter medium therein which minimizes clogging of the diffusing main body.

3,746,324

SLAG SCREEN FOR REFINING FURNACE

Masaki Ojima, Akashi, and Masahiro Arata, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sept. 8, 1971, Ser. No. 178,724
Int. Cl. C21c 5/46
U.S. Cl. 266—1 R 4 Claims



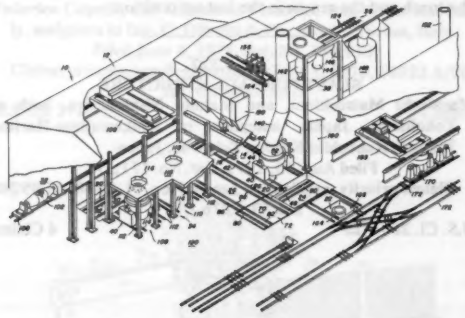
A slag screen is placed at the outlet of a refining furnace which includes a plurality of cooling tubes covered with insulation and attached at both ends to the furnace with means to control the passage of cooling fluid through the tubes and automatic temperature controlled valve to control the flow of cooling fluid through the tubes to obtain the desired temperature on the surface of the insulation to collect the optimum amount of slag and dust, to obtain the proper spacing for the passage of gases from the refining surface.

3,746,325

BASIC OXYGEN STEEL MAKING FACILITY AND METHOD OF OXYGEN REFINING OF STEEL

Charles A. Freeberg, 343 Newburn Drive, Pittsburgh, Pa.; Alfred G. Ganss, deceased, late of New Kensington, Pa., and Shirley Ganss, legal representative, 435 Argon Drive, Lower Burrell, Pa.

Filed Dec. 1, 1970, Ser. No. 94,101
Int. Cl. C21c 5/00
U.S. Cl. 266—13 8 Claims



A basic oxygen steel making facility and method of oxygen refining of steel is disclosed wherein there are two or more mobile furnaces, each comprising a wheeled support on which is fixed an upright top blow converter that moves around a quadrangle about which are arranged charging, blowing, and teeming stations, with provision being also made for removing slag after each cycle of operation. Two opposed sides of the quadrangle have tracks at an upper level on which the mobile furnaces move in succession on their own wheels, while the other two opposed sides have tracks at a lower level. On each of these two lower level tracks is a transfer truck or bridge that may shuttle back and forth between the ends of the upper level tracks. Each of these transfer bridges has a deck with tracks thereon that is brought by movement of the bridge into vertical and horizontal register with the ends of the upper level tracks, and which, then, in effect, forms extension thereof, so that the mobile furnaces may roll from one of the upper level

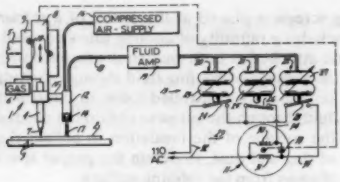
tracks onto the bridge and be carried by the bridge to the other of the upper level tracks, and then roll from the bridge on its own wheels onto other upper level tracks. This arrangement makes possible an operation in which each of the two or furnaces are charged in succession, blown with oxygen in succession, and thereafter tapped and recycled, so that one conventional blowing station can serve each of the furnaces while the pre-blowing and post-blowing operations are carried out elsewhere. Provision is made off one corner of the quadrangle for relining a furnace and holding another one in reserve.

3,746,326

FLAME CUTTING TORCH CONTROL

Jon C. Wirth, Brookfield, and Frederick J. Balfanz, Waukesha, both of Wis., assignors to C-R-O Engineering Co., Inc., Brookfield, Wis.

Filed July 22, 1971, Ser. No. 165,261
Int. Cl. B23k 7/10
U.S. Cl. 266—23 M **9 Claims**



A fluid nozzle moves with the flame cutting torch and establishes a stream toward a plate to be cut. The back pressure in the nozzle actuates a fluid pressure-switch system having a variable set point control to actuate a torch positioner for high and low points as well as a lost plate. The switches actuate a reversible motor to position the torch and attached sensor with respect to the plate within the high and low points. The pressure-switch system may be individual fluid actuated switches for each of the three conditions or a pair of switches actuated from a fluid logic system.

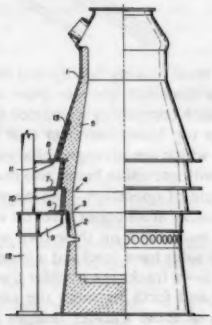
If the plate is not sensed the motor is de-energized to hold the torch and the sensor in the last set position.

3,746,327

BLAST FURNACE STRUCTURE

Masatoshi Matsushima, and Makoto Nishinomiya, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 13, 1971, Ser. No. 171,576
Claims priority, application Japan, Nov. 11, 1970, 45/99288
Int. Cl. F27b 1/12
U.S. Cl. 266—25 **4 Claims**



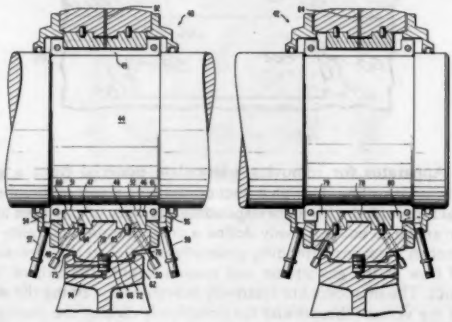
Refractory bricks above the cylindrical section are divided into some sections and the bricks in each section are supported by each ring girder which in turn is supported by the support disposed outside of the main body of the blast furnace.

3,746,328

FLUID BEARING SUPPORT FOR TILTABLE METALLURGICAL VESSELS

Judson W. Martt, Amsterdam, Ohio, assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1971, Ser. No. 184,560
Int. Cl. C21c 5/46
U.S. Cl. 266—36 P **15 Claims**



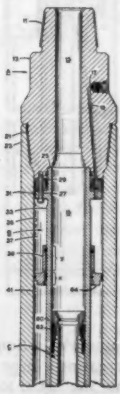
Concept and application of balanced fluid load support of tiltable, heavy loads, for example metallurgical vessels such as a basic oxygen furnace. Fluid bearing structures are provided which compensate for sag along the axis of BOF trunnion shafts due to the weight of the vessel and its load and also compensate for effects of sag during repeatedly changing load and tilting conditions. Such fluid bearing structures also provide for expansion along the axis of the trunnion shafts due to changing temperature conditions encountered by the vessel and its support structure, provide for long-life ease of rotation of the vessel about the trunnion shaft axis, and further provide indications of bearing operating conditions.

3,746,329

PISTON TYPE SHOCK ABSORBING AND STATIC LOAD SUPPORTING DRILL STRING APPARATUS

Edward M. Galle, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Nov. 5, 1971, Ser. No. 195,999
Int. Cl. F16l 9/18
U.S. Cl. 267—125 **8 Claims**



Apparatus is disclosed for use in a drill string during rotary well drilling for supporting the static loads and for absorbing

the shock loading imposed upon a drill bit. An improved separation element in the form of solid piston prevents migration of a shock absorbing gas into a liquid contained in the apparatus. The piston configuration and its annular seal arrangement solve a previously experienced gas migration problem. As a consequence, gas molecules are effectively excluded from regions where they otherwise interfere with normal operation of any components of the apparatus.

3,746,330

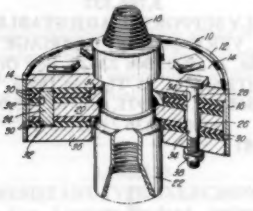
DRILL STEM SHOCK ABSORBER

William Taciuk, Box 702, Labrador City, Newfoundland, Canada

Continuation-in-part of Ser. No. 883,144, Dec. 8, 1969. This application Oct. 28, 1971, Ser. No. 193,391

Int. Cl. F16f *15/10*

U.S. Cl. 267—137 **8 Claims**



From a broad aspect, the present invention relates to a shock absorber for connecting a drive shaft with a driven shaft. A drive plate is attached to the drive shaft and a driven plate, axially disposed from the drive plate, is connected to a driven shaft. A washer is axially disposed from the driven plate on the oppsoite side from the drive plate. A first and second resilient means is provided between the driven plate and the drive plate and between the driven plate and the washer, respectively. Pin projections extend from the driven plate into at least one of the first and second resilient means. Fastening means extend between the drive plate and the washer to precompress the first and second resilient means to a predetermined pressure and to cause the resilient to compress against the pin projections extending therein. The fastening means also pass through the plane of the driven plate without connection therewith.

3,746,331

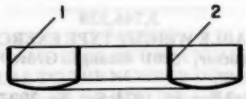
ANNULAR SPRINGS

Baroir Ashikian, B-Ashikian 505 Trechelle, Sherbrooke, Quebec, Canada

Filed Aug. 30, 1971, Ser. No. 176,079

Int. Cl. F16f *1/18*

U.S. Cl. 267—182 **4 Claims**



An annular web made of spring alloy and having a suitable cross section provides a radial elastic support between a part contacting web's inner periphery and another contacting web's outer periphery.

3,746,332

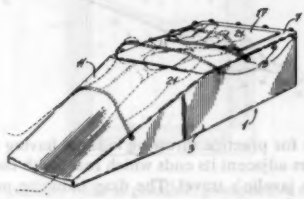
SUPPORT FOR HAND, WRIST AND FOREARM SURGERY

Robert W. Hakstian, 1380 Scarboro Road, Town of Mount Royal, Quebec, Canada

Filed Apr. 23, 1971, Ser. No. 136,764

Int. Cl. A61g *13/00*

U.S. Cl. 269—328 **5 Claims**



A workbench for use in forearm, wrist, hand and finger surgery. It is formed of a ramp for the positioning of a patient's forearm, the ramp merging into a horizontal platform for the placing of the patient's wrist and hand. Studs project laterally from the edges of the ramp and the platform to serve for fixing elastic bands used in securing the patient's hand and forearm to the bench. The platform has an upwardly open recess into which fits a wooden work plate. This plate serves in the sculpting of bone grafts for use in reconstructive hand surgery. A T-bar support can be attached to the platform in an upright position for the palm-down placement of the fingers to facilitate certain joint surgery procedures.

3,746,333

PAPER SHEET FEED CONTROL DEVICE FOR PRINTING MACHINES, DUPLICATORS AND MACHINES FOR THE TREATMENT OF SHEETS IN GENERAL

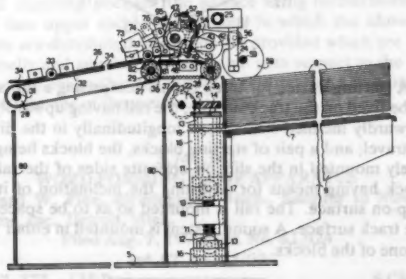
Federico Capetti, and Giancarlo Terzuolo, both of Torino, Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Torino, Italy

Filed June 4, 1971, Ser. No. 149,933

Claims priority, application Italy, June 5, 1970, 68922 A/70

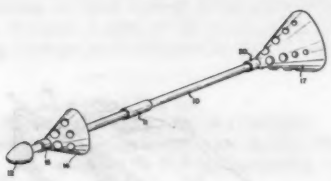
Int. Cl. B65h *3/46*

U.S. Cl. 271—56 **9 Claims**



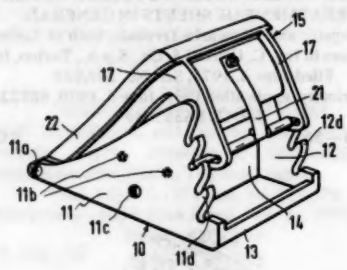
A paper-sheet feed control device is disclosed including a feeler member for detecting oversize sheets of paper or simultaneous feeding of two or more sheets, and means to reject these sheets responsive to signals from the feeler member. The feeler member includes a roller integral with a movable member of a thickness gauge which establishes a standard thickness for sheets to be handled.

3,746,334
PRACTICE JAVELIN
Jerry D. Stubblefield, 3235 Strathmore Place, Eugene, Oreg.
Filed Sept. 3, 1971, Ser. No. 177,692
Int. Cl. A63b *65/02*
U.S. Cl. 272—59 R 4 Claims



A javelin for practice throwing indoors having drag inducing members adjacent its ends which react with the air-stream to limit the javelin's travel. The drag inducing members are preferably of conical shape, apertured to provide the drag desired without causing unstability of the javelin in flight. The javelin additionally includes a blunt resilient impact member at the javelin's forward end to prevent damage to floor or wall surfaces.

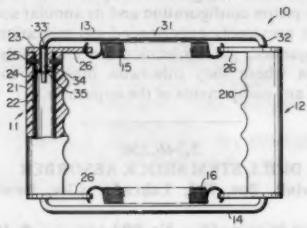
3,746,335
TRACK MOUNTED RAIL AND ADJUSTABLE STARTING BLOCK THEREFOR
Walter Fichter, Schiltach; Otto Armbruster, Hornberg, and Josef King, Schramberg-Sulgen, all of Germany, assignors to Firma Gebruder Junghans G.m.b.H., Schramberg, Germany
Filed Jan. 22, 1971, Ser. No. 108,718
Claims priority, application Germany, Jan. 29, 1970, P 20 04 031.7
Int. Cl. A63b *69/00*
U.S. Cl. 272—59 A 2 Claims



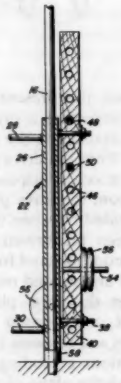
A starting device for track events comprising a rail adapted to be fixed on the track surface, the rail having upwardly open, forwardly inclined slits spaced longitudinally in the direction of travel; and a pair of starting blocks, the blocks being selectively mounted in the slits on opposite sides of the rail, each block having means for adjusting the inclination of its front step-on surface. The rail is mounted so as to be spaced from the track surface. A sound system is mounted in either the rail or one of the blocks.

3,746,336
WRIST EXERCISER
Kametaro Tanimoto, Horinouchi 3-6-8, Suginamiku, Tokyo, Japan
Filed Feb. 24, 1972, Ser. No. 229,094
Int. Cl. A63b *21/32*
U.S. Cl. 272—67 2 Claims

An exerciser to be used for reinforcing wrist muscles, which comprises a pair of spaced grips to be grasped by left and right hands, a pair of rod members for connecting at the prescribed constant interspace and supporting the grips in a manner such that they can freely turn about their longitudinal axis, and springs for exerting resilient resistance and restoring force upon turning of the grips.



3,746,337
GUIDINGLY SUPPORTED ADJUSTABLE WEIGHT VERTICAL LIFT CARRIAGE
Louis G. Riecke, Jr., P.O. Box 23428, New Orleans, La., and Thomas J. O'Hare, Jr. 81 Thorton Drive, Chalmette, La.
Filed Apr. 19, 1971, Ser. No. 135,098
Int. Cl. A63b *23/02, 23/04*
U.S. Cl. 272—81 5 Claims

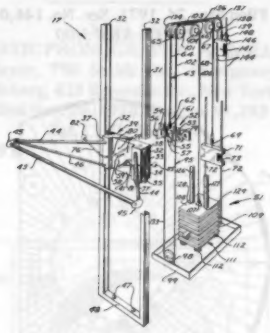


A pair of upstanding parallel guides stationarily supported from a suitable support structure. A weight supporting carriage is guidingly engaged with the guides for free vertical shifting therealong and the carriage includes a main frame defining an open top and open bottom recess opening horizontally outwardly to one side of a plane containing the guides and in which a person using the exercising apparatus may be disposed with his body centered relative to the aforementioned frame. The carriage includes hand grips which may be vertically adjusted relative thereto and means for removably attaching a selected member of weights thereto.

3,746,338
MOVABLE WEIGHT TYPE EXERCISING
Richard I. Proctor, 3201 Orange Grove Avenue, North Highlands, Calif.
Filed Dec. 20, 1971, Ser. No. 209,765
Int. Cl. A63b *21/06, 21/10*
U.S. Cl. 272—81 10 Claims

A vertically elongated framework encloses a stacked array of metal plates selectively attachable in any desired quantity to the lower end of a wire cable passing around an arrangement of pulleys which afford an oppositely moving, adjacent pair of vertical cable runs. A carriage, including a horizontal

bar, is vertically movable on the framework and includes a pair of cable clamping mechanisms enabling the user of the machine to connect the carriage to a predetermined one of the two oppositely moving vertical cable runs, thereby providing



weight resistance to the horizontal bar either in an upward or a downward direction. By clamping both cable runs concurrently the horizontal bar is immobilized at any desired elevation and can be used as a chinning bar, ballet bar or support for auxiliary equipment.

3,746,339

SPRING RESISTANT TYPE EXERCISING DEVICE

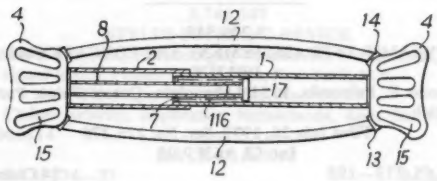
John William Cox, London, England, assignor to Compret N.V., Amsterdam, Netherlands

Filed June 7, 1971, Ser. No. 150,649

Claims priority, application Great Britain, June 11, 1970, 28,426/70; Oct. 7, 1970, 47,693/70

Int. Cl. A63b *21/02, 21/00*

U.S. Cl. 272—82 **15 Claims**



A physical exerciser having first and second elongated members so mounted as to permit the members to slide longitudinally relative to one another. First and second handles respectively are carried by the members on the ends thereof remote from one another. Resilient members are disposed between the members to resist movements of the handles towards one another. Pulling exercises are effected by pulling the rope lengths, positioned between the two handles, apart to cause the handles to move towards one another. Extension of the resilient members cause sliding movements of the members towards one another.

3,746,340

FOOT-BALL GAME EMPLOYING A NUMBER OF BALLS EQUAL TO THE NUMBER OF GOALS

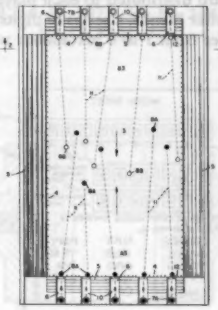
Robert Ellis, 350 Lomas Santa Fe Drive, Solana Beach, Calif.

Filed Dec. 2, 1971, Ser. No. 204,048

Int. Cl. A63b *71/00*

U.S. Cl. 273—95 H **1 Claim**

A foot-ball game in which a plurality of players, an equal number on each opposing team, kick and try to goal a plurality of foot-balls, preferably one ball for each player, each player simultaneously kicking off the ball from his individual goal towards the opposite end of the field occupied by the opposing team. Each team's balls are of different color and each team



tries to get as many balls as possible, irrespective of color, into the opposite teams goals.

3,746,341

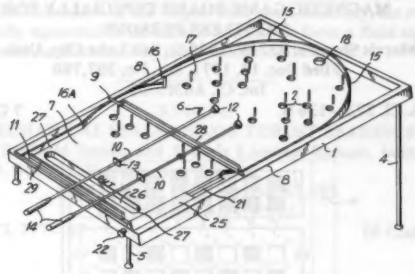
PIN BALL GAME APPARATUS WITH SUPPLEMENTAL MANUAL

Andrew J. Reisinger, 61 Chestnut Avenue, East Setauket, N.Y.

Filed June 11, 1970, Ser. No. 43,426

Int. Cl. A63d *3/02*

U.S. Cl. 273—121 A **3 Claims**



A game apparatus is provided having an inclined playing surface and a projection mechanism to project balls onto the surface one at a time. The surface is provided with a plurality of ball receiving pockets, the surface being furthermore divided into upper and lower sections in which the aforesaid pockets are distributed. Two rods are provided which are longitudinally and angularly displaceable with respect to the surface and to each other for purposes of directing a ball on the surface into one of the various pockets.

3,746,342

WORD FORMING GAME APPARATUS

Maynard W. Fine, Birmingham, Mich., assignor to Nuword Game, Inc., Detroit, Mich.

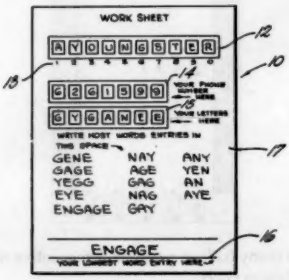
Filed Aug. 7, 1970, Ser. No. 62,024

Int. Cl. A63f *3/00*

U.S. Cl. 273—135 D **5 Claims**

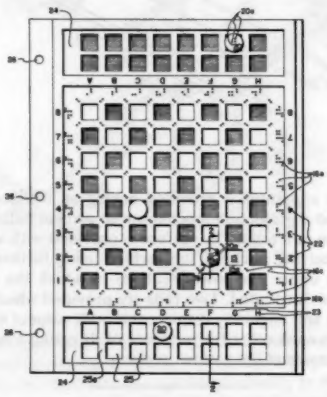
A game is provided which comprises assigning a key word having at least ten letters to one or more players, assigning serially increasing digits from 1 through 0 to 10 letters of the key word, assigning a uniform key number to each player, as for example the player's telephone number, and having each player derive a group of corresponding letters by substituting the digits of the key number for the letters of the key word corresponding to each digit and, utilizing each of the derived or corresponding letters only once in each word, composing

either the longest word or the greatest number of words possible from the group of substituted or derived corresponding letters. The game is played with equipment comprising a work sheet or score card distributed to each player having a series of key word or letter blanks, a series of digits arranged serially in ascending order from 1 to 0 juxtaposed with the key letter



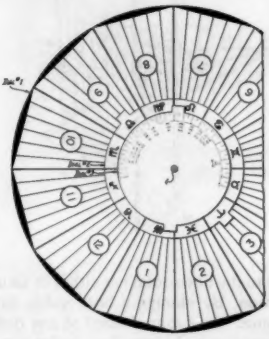
blanks, a series of key number blanks, and a series of corresponding or derived letter blanks, and a blank space for entering the longest word and space for entering a plurality of smaller words. Additionally, a plurality of cards are provided each containing a key word or words having at least 10 letters in total to be used for each game.

3,746,343
MAGNETIC GAME BOARD ESPECIALLY FOR SIGHTLESS PERSONS
D. Morris Shapiro, 937 W. 1820 S., Salt Lake City, Utah
Filed Dec. 14, 1971, Ser. No. 207,780
Int. Cl. A63f 3/02
U.S. Cl. 273—136 B **7 Claims**



A game board including an essentially rigid metallic backing which is sensitive to magnetic forces, a playing surface positioned thereover and a grid arranged to be reflective of the playing surface. The grid is constructed so as to form a pattern of raised ridges surrounding depressions reflecting a game pattern and shape on the playing surface. Braille characters projecting from the top of the grid enable a blind player to identify the game pattern reflected by the individual depressions and to locate the positions of game playing pieces. Playing pieces having Braille characters thereon, and magnets attached thereto, are fitted into and are magnetically held within the depressions in the grid. Holes are punched along one edge of the game board to conform with the rings of a loose leaf binder so that one or more game boards can be arranged in the form of book pages.

3,746,344
ASTROLOGICAL TEACHING AND AMUSEMENT DEVICE
Joseph E. Hodan, III, 1590 Ebener St., Apt. 5, Redwood City, Calif.
Filed May 24, 1971, Ser. No. 146,019
Int. Cl. A63f 3/00
U.S. Cl. 273—134 D **4 Claims**



The device employs three concentric discs of different diameters arranged for rotating relation with respect to each other and bears radial graduations on each disc showing respectively, astrological houses, house numbers, zodiac signs and degrees of a circle. Movable pieces similar to chessmen, but bearing a planet symbol on each piece are placed in turn on one of the discs in response to throws of dice. When all the pieces are placed, their relative positions or astrological aspects are determined by relative rotation of a disc and the answers to astrological questions are obtained by reference to suitable charts.

3,746,345
PYRAMID TYPE AMUSEMENT AND EDUCATIONAL DEVICE
Thomas P. Palazzolo, 1151 Lakepointe, Grosse Pointe Park, Mich.
Filed July 26, 1972, Ser. No. 275,278
Int. Cl. A63f 9/08
U.S. Cl. 273—155 **14 Claims**

An elongated parallel-sided series of identical forms of similar tetrahedral pyramid shape, molded in solid or hollow section of a rigid plastic material, are flexibly articulated to one another at the adjacent edges of like successive coplanar equilateral triangular bases of said forms, the remaining three sides of each form being identical right or 90° triangles whose base edges equal in length that of the equilateral triangle sides. Successive adjacent base triangle edges of the strip are then in alternating 60° intersecting relation to one another as flexibly articulated by a suitable backing ribbing or tape. The number of said pyramid forms is a whole multiple of four; and appropriate primarily intended manipulations of said forms relative to one another bring base edges of certain of their right triangular side surfaces into edge-to-edge relation to one another in a manner such that four adjacent juxtaposed pyramids will define a cube. Depending upon the number of pyramid forms and their manner of manipulation, a number of

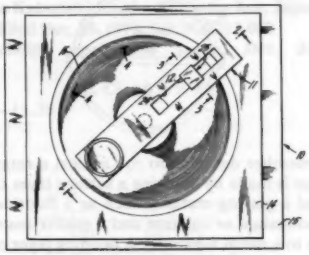
different basic modular arrangements of such like individual, flexibly articulated cubes may be set up for one purpose or another. In the alternative, many freeform combinations may be arrived at.

3,746,346

ACOUSTIC PHONOGRAPHIC APPARATUS

Richard J. Mayer, 790 Smith Rd., Parsippany, N.J., and Benjamin Kinberg, 425 Riverside Dr., New York, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,293
Int. Cl. G11b *25/04*
U.S. Cl. 274—9 R 2 Claims



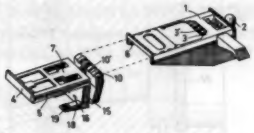
An acoustic phonograph including a stationary vinyl coated paperboard phonograph record provided with a sound track of hill and dale configuration, an arm rotatably mounted on the record, and a needle carried by the arm engaging the sound track to cause the record to vibrationally flex and act as a speaker reproducing the sound recorded on the record.

3,746,347

STYLUS-SECURING-DEVICE

Eduard Camerik, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1971, Ser. No. 136,077
Claims priority, application Netherlands, Apr. 30, 1970, 7006414
Int. Cl. G11b *3/02*
U.S. Cl. 274—37 3 Claims



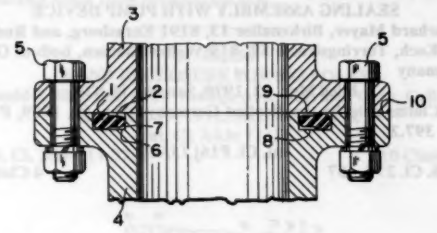
A device for detachably securing a stylus cartridge, which is provided with plugs, in a tone arm of a record player. The device comprises a plate-shaped slide which is adapted to be inserted into the head part of the arm and is provided with electrically conducting contact strips which, in the inserted condition of the slide, are in contact with electrically conducting strips provided in the head part of the arm. The slide has a rear wall part in which apertures have been formed which constitute sockets for the plugs of the stylus cartridge and in which parts of the contact strips of the slide extend so as to form contact members for the plugs, permitting the stylus cartridge to be mechanically and electrically connected to the slide by a single insertion operation.

3,746,348

SEALING RING WITH RETAINING MEANS

John G. Stone, Los Angeles, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jan. 15, 1971, Ser. No. 106,678
Int. Cl. F16j *15/00*
U.S. Cl. 277—11 8 Claims



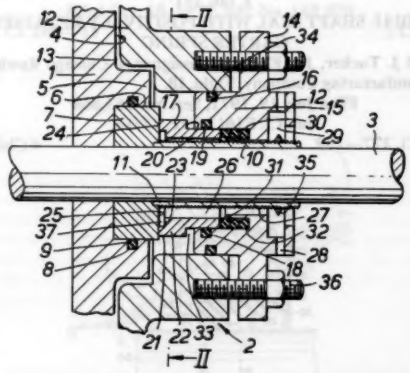
A sealing ring such as an O-ring for flange type fittings and the like wherein the ring is axially squeezed in an annular chamber defined by the fitting parts, the ring having radially extending nubs which at their radial extremities have an interference fit with one of the radially spaced apart walls of the chamber thus to retain the ring in the chamber during assembly or disassembly of the parts and to coaxially locate the ring in the chamber in close proximity to that one of the radially spaced apart walls toward which fluid pressure tends to move the ring. The nubs are preferably of cylindrical form with rounded extremities and are of diameter less than the initial axial dimension of the ring so that, upon assembly, the ring is axially squeezed in its normal manner to form a fluid-tight joint without hindrance by the presence of the nubs.

3,746,349

MECHANICAL SEALS AND/OR THRUST BEARINGS

John Reginald Smale, and Francis Lambert Robson, both of P.O. Box 792, Rotorua, New Zealand

Filed Aug. 26, 1970, Ser. No. 67,195
Int. Cl. F16j *15/54*, *15/16*
U.S. Cl. 277—67 10 Claims



The invention relates to a mechanical seal and/or thrust bearing and comprises a thrust disc mounted on a shaft and providing a first bearing surface, and a cylinder providing an annular bearing surface mounted eccentrically about the shaft and spaced there from and held with its annular bearing surface in contact with the first bearing surface. As the shaft rotates relative rotation of the bearing surface is effected and coolant is fed between the shaft and cylinder to the surface of the thrust disc radially inwardly of the cylinder and the lubricant is fed to the surface of the thrust disc radially outwardly

of the cylinder thus effecting cooling and lubrication of the mating surfaces which alter with rotation of the shaft. The shaft will rotate a rotor to rotate fluid within a closed housing, such as a pump housing, the device of the invention forming a seal between the shaft and the fluid and/or a thrust bearing for the shaft which passes from the housing.

3,746,350

SEALING ASSEMBLY WITH PUMP DEVICE

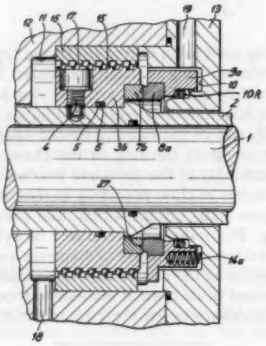
Ehrhard Mayer, Birkenallee 13, 8191 Eurasburg, and Rudolf Koch, Torringstrasse 57, 819 Wolfratshausen, both of Germany

Filed Mar. 12, 1970, Ser. No. 18,820

Claims priority, application Germany, Mar. 17, 1969, P 19 13 397.2

Int. Cl. F16j *15/40*

U.S. Cl. 277—67 **4 Claims**



A sealing assembly for a rotatable shaft, wherein a cooling, lubricating, or buffer medium is circulated by means of an external thread on a rotatable member and an internal thread in a non-rotatable member. The internal thread has a hand opposite to that of the external thread and surrounds the latter with a small radial clearance.

3,746,351

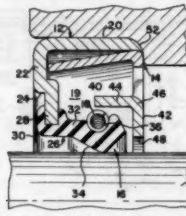
RADIAL SHAFT SEAL WITH POSITIVELY RETAINED GARTER SPRING

Alfred J. Tucker, Jr., Elgin, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed July 19, 1971, Ser. No. 163,868

Int. Cl. F16j *15/32, 15/54*

U.S. Cl. 277—152 **4 Claims**



A radially acting shaft seal having associated therewith a garter spring which is at least partially confined within a spring-retaining groove formed in the primary sealing lip by radially spaced-apart tabs or fingers extending axially outwardly from an inner rigid support element. The invention reduces or eliminates the tendency of the garter spring to "pop out" without substantially decreasing the tolerance of the seal assembly to radial run-out. In addition, seals of the present invention utilize relatively shallow spring-retaining grooves with the result that the sealing element is less likely to suffer damage upon separation from the mold.

3,746,352

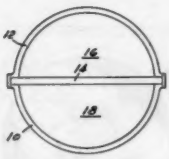
RUBBING SEAL FOR HIGH TEMPERATURE CERAMICS

Vemulapalli Durganageswar Bao, 22023 Willow Court, Woodhaven, and Yeshwant Pandharinath Telang, 20693 Canal Drive, Grosse Ile, both of Mich.

Filed Sept. 2, 1969, Ser. No. 854,397

Int. Cl. F16j *15/16*

U.S. Cl. 277—235 R **8 Claims**



A seal member designed to rub against a rotating ceramic regenerator is made by applying a surface layer consisting essentially of a glazing material such as a fluoride of lithium, sodium, potassium or calcium and a matrix material such as zinc oxide to a metal substrate. A bonding layer of nickel-aluminide can be applied to the substrate and an intermediate layer of nickel oxide and calcium fluoride can be included between the nickel-aluminide layer and the surface layer. The glazing material forms a low friction glaze at a temperature depending primarily on the composition thereof with lithium fluoride compositions producing useful glazes between about 450°–900°$\pi\zeta$ f., calcium fluoride compositions producing useful glazes at about 700°–1,800° F., and sodium and potassium compositions producing useful glazes in intermediate temperature ranges.

3,746,353

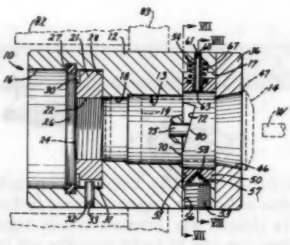
COLLET CHUCK ADAPTER

Flateau Allen, Parchment, Mich., assignor to Kalamazoo Industries, Inc., Kalamazoo, Mich.

Filed Aug. 30, 1971, Ser. No. 175,993

Int. Cl. B23b *31/20*

U.S. Cl. 279—51 **10 Claims**



A collet chuck adapter having a hollow cylindrical body adapted to be carried by supporting means, such as a radial jaw chuck, with the forward end of the adapter extending from the supporting means. A collet mounting ring is carried for limited axial movement within the hollow body, a collet being supported thereon and extending forwardly therefrom through the forward end of the body. A cam ring is loosely radially supported within the forward end of the body. Means accessable from the exterior of the body forwardly of the supporting means are provided for radially shifting the cam ring with respect to the body. A collet engaging ring is fixed to the forward end of the body, axially retains the cam ring

therewithin and has a rearwardly tapering opening through which a tapered nose portion of the collet extends, an intermediate portion of the collet extending loosely through the cam ring. The rearward face of the cam ring includes an opposed pair of ramps sloped with respect to the radial plane of the cam ring. A spaced pair of actuating rods extend axially but noncentrally through the body between respective ramp surfaces of the cam ring and the collet mounting ring. As a result, radial adjustment of the cam ring causes, through said ramp surfaces and actuating rods, a corresponding axial movement of the collet mounting ring for tightening the collet on a workpiece.

3,746,354

HEEL-HOLDING DEVICE FOR SAFETY SKI BINDINGS

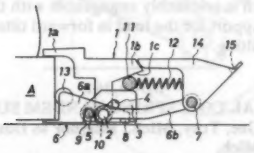
Yoichi Nagasaki, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Dec. 28, 1971, Ser. No. 213,002

Claims priority, application Japan, Dec. 31, 1970, 45/123583

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 T **6 Claims**



A heel-holding device for a binding comprises a pedal depressed by the heel of a ski boot and pivotally supported at one end thereof, the pedal having a shaft at an intermediate thereof, a retaining member rotatably supported and having an elongated slot perforated therein, the shaft being inserted in the slot so as to be guidedly movable therein, a heel clamp pivotally supported about the shaft and hung over the pedal, and a spring-biased locking member urging the clamp toward the heel and holding the retaining member not to be rotated. When the clamp is subjected to a force which acts to release the heel-holding power of the clamp and which exceeds the urging force of the locking member, the locking member is moved away against its biasing force, permitting the retaining member to be rotated, whereby the shaft is raised upward along the slot of the retaining member, simultaneously lifting the clamp, which enables a wider space to be formed between the clamp upwardly raised and the ski surface for easier disengagement of the boot from the binding.

3,746,355

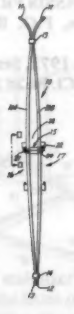
BLOCK DEVICE FOR MAINTAINING CAMBER IN SKIS

Willard L. Holley, 2131 Addison, Muskegon, Mich.

Filed Oct. 6, 1971, Ser. No. 186,987

Int. Cl. A63c *11/00*

U.S. Cl. 280—11.37 C **5 Claims**



A device for maintaining the camber in skis during storage. The device requires that the tip and tail portions of each ski in a pair of skis are to be coupled bottom-to-bottom, tip-to-tip and tail-to-tail. A separator block is positioned at the midpoint of the camber and is of a desired thickness to increase and/or maintain the spacing between the skis at the midpoint of the camber and thereby maintain the skis at the desired camber. Position maintaining rods are mounted on the separator block for preventing the separator block from moving laterally relative to said skis to thereby prevent an inadvertent loss of said separator block from between the skis.

3,746,356

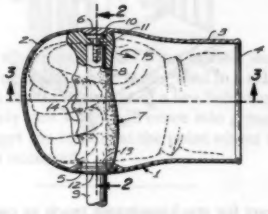
HAND ENCLOSURE FOR SKI POLES

Donald R. Shipstad, 4929 Matillja Ave., Sherman Oaks, Calif.

Filed Mar. 19, 1971, Ser. No. 126,076

Int. Cl. A63c *11/22*

U.S. Cl. 280—11.37 H **10 Claims**



An enclosure dimensioned to receive a skier's gloved hand and containing a hand grip secured to a ski pole, the grip being removably or permanently secured at its ends to the top and bottom of the enclosure so that a skier may insert his gloved hand around the grip and clench his fist.

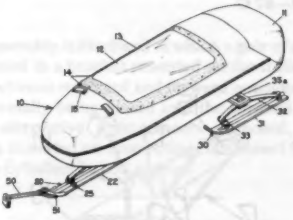
3,746,357

SNOWMOBILE AMBULANCES

David R. Haskins, Rt. 3, Tomahawk, Wis.

Filed Oct. 18, 1971, Ser. No. 189,870

U.S. Cl. 280—15 **3 Claims**



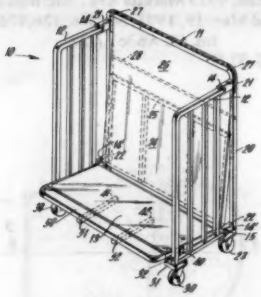
An ambulance sled for towing with a snowmobile. The ambulance sled has a pair of non-steerable rear skis and a tow bar assembly attached to a steerable front ski. An enclosed fiberglass body shell is mounted on the leaf-spring ski units and has a rear end door to facilitate insertion and removal of a stretcher. The bottom of the body shell has a pair of longitudinal recessed tracks in which the stretcher wheels run and for holding the stretcher in place. The body shell has a window in its top side and a pair of air intake scoops mounted forwardly of the window.

3,746,358

HAND CART FOR STACKING GOODS IN INTERLOCKING RELATIONSHIP

George W. Swick, Jr., Edina, Minn.; Robert A. Priest, Fort Worth, Tex., and Jerry R. Trimble, Saint Paul, Minn., assignors to The Cornelius Company, Minneapolis, Minn.

Filed Aug. 9, 1971, Ser. No. 170,167
Int. Cl. B62b *11/00*
U.S. Cl. 280—36 R 15 Claims



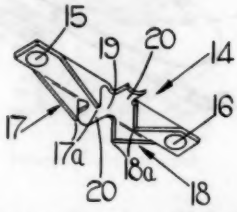
A hand cart for stacking goods, such as cartons, beverage six-packs, etc., includes a vertical extending carrying space that is defined by a back main frame member, two vertical side structures, and a bottom platform structure, with the bottom platform structure being inclined relative to the horizontal so as to define with the back frame member an included angle less than 90°. In addition, the back main frame is inclined relative to the vertical whereby packaged goods stacked on the hand cart are prevented from toppling, and the goods are interlocked in such manner that the packages must be removed in a desired sequence from the stack of goods.

3,746,359

ELECTRIC SWITCHES

Keith Lewis, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 14, 1972, Ser. No. 234,610
Claims priority, application Great Britain, Mar. 20, 1971, 7,629/71
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 G 5 Claims



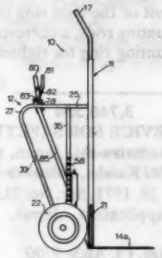
An electric switch has an actuating mechanism movable to any one of three positions. The mechanism engages a conductive arm in the form of a metal strip having downturned flanges which provide pivots about which the arm is moved by the actuating mechanism to interconnect pairs of contacts within the switch.

3,746,360

HAND TRUCK WITH ADJUSTABLE TOE PIVOT MEANS

Burdette B. Crawford, 511 Elm St., Chadbourn, N.C.

Division of Ser. No. 29,028, April 16, 1970, Pat. No. 3,642,301. This application Dec. 27, 1971, Ser. No. 212,560
Int. Cl. B62b *1/12*
U.S. Cl. 280—47.12 8 Claims



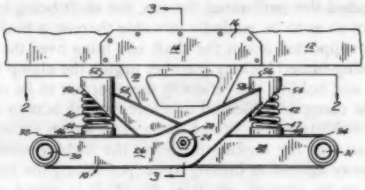
A two-wheel, tilt type hand truck incorporates an axle-wheel arrangement for transporting the load and a movable toe pivot which is releasably engageable with the floor to provide pivotal support for the load in forward tilted positions and for rearward tilting.

3,746,361

INDIVIDUAL COIL SPRING TANDEM SUSPENSION

Donald J. McGee, Troy, Mich., assignor to Dura Corporation, Southfield, Mich.

Filed Aug. 31, 1970, Ser. No. 68,386
Int. Cl. B60g *19/02, 19/08*
U.S. Cl. 280—104.5 R 14 Claims



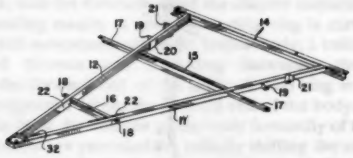
This invention relates to a suspension for tandem axles of a truck or trailer. A pair of beams are journaled on a common trunnion. On one end of each beam a vertically flexible member depends downwardly into contact with the upper portion of the other beam intermediate one end of the other beam and the trunnion. Both flexible members are simultaneously flexed at both ends during increase of load on the suspension and traversal of irregularities on the road.

3,746,362

CHASSIS FRAME

Jean Albert Schittenhelm, P.O. Box No. 13, Trignac (44), France

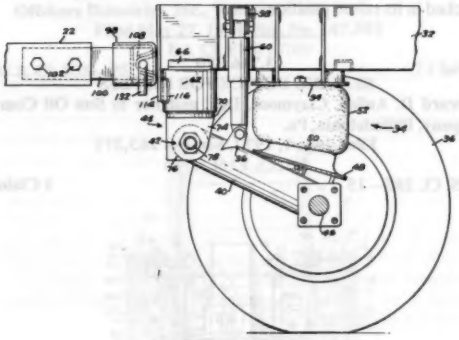
Filed Aug. 2, 1971, Ser. No. 168,071
Int. Cl. B62d *21/00*
U.S. Cl. 280—106 T 10 Claims



A light-weight frame or chassis for supporting vehicle-towed trailers. The frame is generally "A"-shaped having two

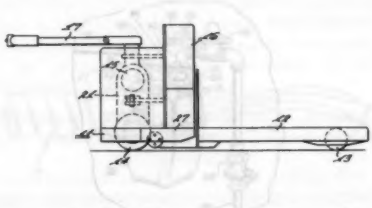
long principal sides beams connected at one end and several transverse braces connecting the side beams. The frame is attached to an automobile at its apex.

3,746,363
SUSPENSION FOR LAND VEHICLES
David R. Borns, Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Mar. 29, 1971, Ser. No. 128,948
Int. Cl. B62d *17/00*
U.S. Cl. 280—124 A **10 Claims**



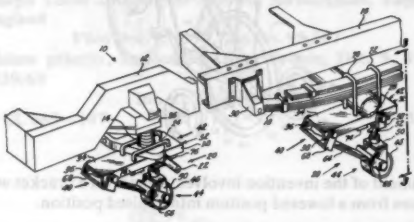
Suspension for an individual wheel of a vehicle wherein a control arm pivotally mounted for vertical swinging on the vehicle frame has a laterally extending wheel spindle, a load-transmitting spring being interposed between the control arm and frame. The mounting includes a receptacle and insert which interfit loosely to facilitate toe-in and camber adjustment by shifting the control arm and which are then welded together. The control arm and its pivot of themselves control lateral and torsional forces on the arm. A bumper mountable on another vehicle is apertured to receive a hasp associated with the suspension and a locking pin to provide a draft and vertical load-transmitting coupling between the vehicles.

3,746,364
MULTIPOSITION STABILIZER WITH A PLURALITY OF WEAR SURFACES
Mark H. Kemner, Park Forest, Ill., assignor to Mark H. Kemner, Milwaukee, Wis.
Filed Mar. 1, 1972, Ser. No. 230,780
Int. Cl. B60r *27/00*
U.S. Cl. 280—150 C **3 Claims**



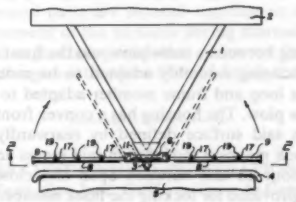
A pair of multiposition stabilizer disks are secured at the laterally opposite sides of the front of a low lift walkie truck to stabilize the truck by abutting the ground when the truck is tipped as when making a sharp turn.

3,746,365
SAFETY JACK WHEEL FOR VEHICLES
Charles J. Kirschbaum, 3300 Valdez Drive, Des Moines, Iowa
Filed Aug. 25, 1971, Ser. No. 174,876
Int. Cl. B60r *27/00*
U.S. Cl. 280—150 A **5 Claims**



A safety jack wheel attachment for a vehicle such as an automobile, truck or trailer which is mounted in a relationship to a given wheel so that in the event of a tire failure or the loss of a wheel, the safety jack wheel will come into ground engaging position to support the vehicle at the point where the disabled wheel or tire has occurred.

3,746,366
FLEXIBLE TRAILER SPLASH AND STONE SHIELD
Lester E. Bruce, 2356 Bradner South R.R. 2, Aldergrove, British Columbia, and Allan L. Bruce, 21915 Fraser Hwy., Langley, British Columbia, both of Canada
Filed Apr. 10, 1972, Ser. No. 242,614
Int. Cl. B60m *27/00*; B62d *25/18*, *65/00*
U.S. Cl. 280—154.5 R **11 Claims**



A shield assembly is disclosed in which a pair of shield members are pivoted in a bracket mounted on the trailer frame for movement between rearward and forward positions, the shield members normally being biased into the forward position by springs. In alternative arrangements purposed, the shield members are mounted on connecting rods biased forwardly in a cylinder or cylinders by coil springs.

3,746,367
RETRACTABLE BICYCLE TRAINING WHEELS
Kenneth L. Johannsen, 1111 West Cedar Ln., Arlington Heights, Ill.
Filed Mar. 3, 1971, Ser. No. 120,606
Int. Cl. B62h *1/10*, *7/00*
U.S. Cl. 280—301 **2 Claims**

An L-shaped bracket is attached to a vertical structural member of a bicycle. Pivotally attached to the bracket is a plate which folds between a raised or a lowered position and latches in either of these two positions. A second embodiment incorporates an adjustable sliding collar which causes a strut to be fixed in either a raised or a lowered position. Auxiliary

wheels are mounted on the plate in the first embodiment and at the end of the strut in the second embodiment. A third em-

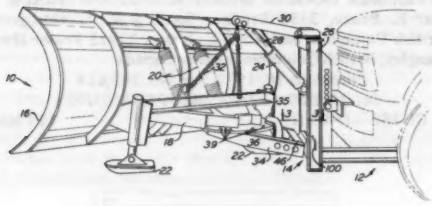
bodiment of the invention involves a wheel on a bracket which rotates from a lowered position into a raised position.

3,746,368

VEHICULAR CARRIED PLOW COUPLING

William Gledhill, and Phillip Leland Sherman, both of Galion, Ohio, assignors to Gledhill Road Machinery Company, Galion, Ohio

Filed Dec. 22, 1971, Ser. No. 211,076
Int. Cl. B60d *3/00*
U.S. Cl. 280—481 **9 Claims**



A coupling between a snow plow and the front of a truck including a housing assembly adapted to be mounted on the truck and a loop and frame member adapted to be mounted on the snow plow. The housing has a convex front surface and a recess in said surface defined by rearwardly converging walls. A hook means is mounted in said recess and is adapted to pivot about an axis between open and closed positions. Means are provided for locking the hook member in its closed position. A frame member is adapted to abut the convex surface on the forward face of the housing member and the loop projects rearwardly from the frame member into the recess where it is held in place by the hook means.

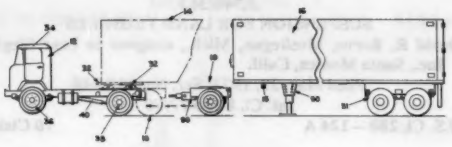
3,746,369

TRUCK TRACTOR CONVERTER DOLLY

Charles G. Neff, Saratoga, Calif., and William F. Beebe, Holland, Mich., assignors to Holland Hitch Company, Holland, Mich.

Filed Dec. 7, 1970, Ser. No. 95,457
Int. Cl. B62d *53/08*
U.S. Cl. 280—476 R **14 Claims**

The structure disclosed herein is a convertor dolly usable alternatively attached to the rear of a truck tractor to form a tandem axle assembly therewith, or attached to the rear of a semi-trailer for hauling another trailer to the rear thereof. The dolly has a forwardly extending draw tongue assembly that is contractible for attachment of the tongue and dolly to a tractor, and extensible for attachment of the tongue and dolly to a trailer. The tongue is lockable in either position. When connected in tandem relation to a tractor, the dolly has limited rotational capacity to accommodate rough terrain without loss of drive traction. A fifth wheel on the dolly is specially vertically shiftable relative to the dolly frame, between a lowered non-coupling position when the dolly is attached in tandem to



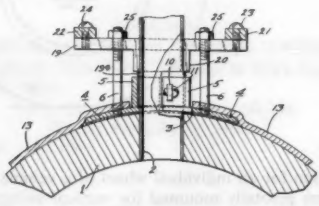
the tractor, and a raised coupling position when used to haul a second trailer. The dolly fifth wheel is specially supported and locked in its raised position.

3,746,370

SEALING DEVICE FOR NIPPLES

Gerard D. Aulisa, Claymont, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed June 1, 1972, Ser. No. 263,371
Int. Cl. F16l *55/16*
U.S. Cl. 285—15 **1 Claim**



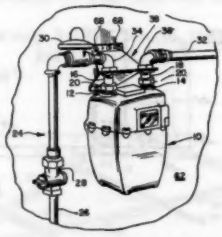
A device for sealing leaks around pressure-tap nipples in a main pipeline without removing the line from service, comprising a split saddle having a bushing surrounding the nipple and clamped to the pipe by means of a band surrounding the pipe and overlying the saddle. Packing is inserted between the bushing and the nipple, and this packing is compressed into a sealing position by means of a split packing gland which surrounds the nipple and is drawn down onto the packing by means of upstanding studs secured to the saddle and passing through the packing gland.

3,746,371

GAS METER SETTING OR THE LIKE

Wilbur R. Leopold, Jr., Decatur, Ill., and deceased Smith, late of Decatur, Ill. (by Beatrice A. Smith, executrix), assignors to Mueller Co., Decatur, Ill.

Filed Aug. 26, 1971, Ser. No. 175,312
Int. Cl. F16l *3/22, 55/00*
U.S. Cl. 285—30 **7 Claims**



A fluid meter setting or installation for gas meters or the like, the setting permitting the fluid supply line to be connected to a service line of a dwelling or the like while rigidly

supporting the meter against torsion. The setting includes a simplified sheet metal bracket capable of being attached to a wall or post, the bracket permitting the use of conventional elbows and straight meter swivel members for properly orienting or supporting the meter. The bracket which is made from identical parts may be assembled at the point of manufacture or may be shipped to the user in nested arrangement of the parts and then assembled at the site, thus, reducing manufacturing and shipping costs. The setting and the bracket are so designed as to eliminate all possibility of gas theft.

3,746,372

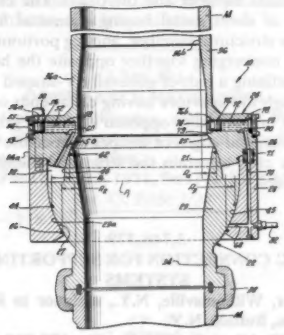
FLEXIBLE PIPE JOINTS

Joseph H. Hynes, Ojai; Walter J. Hintzen, Santa Barbara, and Martin B. Jansen, Ventura, all of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed May 27, 1971, Ser. No. 147,502

Int. Cl. F16l *17/00*

U.S. Cl. 285—95 **7 Claims**



A pressure balanced ball and socket type joint particularly adapted for connecting pipe sections in the mariner riser conductor and choke/kill lines of an undersea drilling rig. Two closed hydraulic systems incorporated in the joint transfer the pressure of the sea water outside the joint and the drilling mud within the joint to selected areas between the ball and socket members to substantially balance the forces which the sea water and drilling mud impose on the joint.

3,746,373

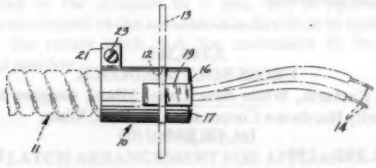
CONNECTOR FOR ELECTRICAL CONDUITS

Anthony G. Prudente, 213 Queen Ann Rd., Bogota, N.J.

Filed May 25, 1970, Ser. No. 39,975

Int. Cl. H02g *3/08*

U.S. Cl. 285—162 **10 Claims**



A connector capable of being quickly connected to a cable or conduit which then may be easily secured within the opening of a conduit box. The connector includes a sleeve body having an entrance opening at one end for receiving the conduit and means located at the other end of the sleeve body for engaging the conduit end and applying an axial force onto said conduit end. Resilient means project from the external surface of the sleeve body for engaging the inner surface of the conduit box opening to secure the connector thereto.

3,746,374

JOINT ARRANGEMENTS

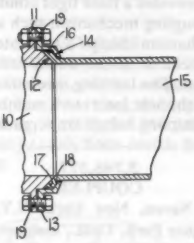
Gordon Sedgwick; Roy Lindop, both of Bolton, and Tom Worsley Nelson, Rosseldale, all of England, assignors to Joseph Lucas)Industries) Limited, Birmingham, England England

Filed Dec. 7, 1970, Ser. No. 95,557

Claims priority, application Great Britain, Dec. 9, 1969, 59,939/69

Int. Cl. F16l *49/00*

U.S. Cl. 285—187 **8 Claims**



A joint arrangement for connecting metal and ceramic parts having different coefficients of thermal expansion includes a pair of metal parts and a ceramic part clamped between them. The metal parts are each formed with frusto-conical surface, the surfaces being coaxial and having different included angles. The ceramic part has a pair of frusto-conical surfaces which are engaged by the corresponding surfaces on the metal parts. The metal parts are secured together so as to permit relative movement of the surfaces during thermal expansion, the included angles being such that points on these surfaces move along the generating lines thereof during thermal expansion.

3,746,375

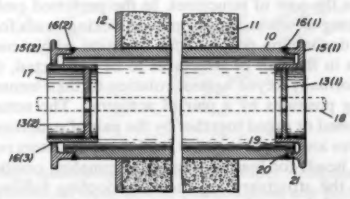
PRESSURE CONTAINMENT PENETRATION NOZZLE

Forrest E. Funk, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Sept. 10, 1969, Ser. No. 856,586

Int. Cl. F16l *13/02*

U.S. Cl. 285—286 **9 Claims**



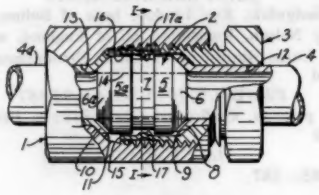
A pre-prepared penetration nozzle for passing electrical conductors or pipes through the walls of a pressure containment vessel which eliminates the necessity of field preparation of weld surfaces.

3,746,376

FLUID TIGHT CONDUIT FASTENING SYSTEM

Harold Gold, 3645 Tolland Rd., Shaker Heights, Ohio

Filed Mar. 16, 1971, Ser. No. 124,741
Int. Cl. F16l 19/00
U.S. Cl. 285—334.2 4 Claims



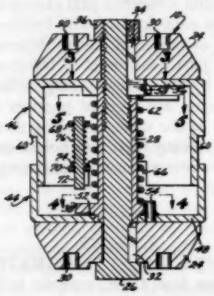
This invention provides a fluid tight conduit union that utilizes a two piece coupling mechanism such as a screw and nut. The coupling mechanism clamps a separate seat insert which is attached to a member of the union assembly by a simple latching mechanism. The latching mechanism maintains positive attachment of the seat insert to a member of the union assembly when the coupling halves are separated.

3,746,377

COUPLER

Lawrence W. de Neveu, New York, N.Y., and Bennet H. Connet, Huntington Park, Calif., assignors to Lawrence W. de Neveu, New York, N.Y.; Bennet H. Connet, Huntington Park, Calif., part interest

Filed Mar. 17, 1971, Ser. No. 125,137
Int. Cl. F16b 7/00
U.S. Cl. 287—2 11 Claims



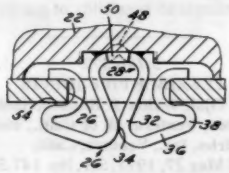
A coupler for releasably connecting together a pair of structures at least one of which is characterized by a recess having an entry opening configured so that a locking means can be inserted through the opening and rotated in the recess. This prevents withdrawal of the locking means and thereby couples together the pair of structures. In the preferred embodiment the locking means includes a pair of locking heads for disposition in decoupling positions for insertion within confronting recesses in the pair of structures to be connected, the heads being normally keyed against rotation to their connecting or coupling positions by a pair of actuators. The actuators are compressed or urged together by the pair of structures as such structures are moved together, and these actuators release the locking heads for biased rotation to coupling positions. This secures the structures together. Decoupling follows manual rotation of the locking heads beyond their decoupling positions to reset positions. This actuates a reset means to keep the locking heads in their rotated, decoupling positions despite the compressed positions of the actuators. After initial separation of the two previously coupled structures, the reset means is disengaged and the actuators again key the heads against biased rotation to their coupling positions until the actuators are again compressed or moved toward one another.

3,746,378

STRUCTURAL ASSEMBLY AND DEFORMABLE CLIP

Engelbert A. Meyer, Union Lake, Mich, assignor to USM Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 831,570, June 9, 1969, abandoned. This application July 8, 1971, Ser. No. 160,785
Int. Cl. F16b 5/04
U.S. Cl. 287—189.36 R 4 Claims



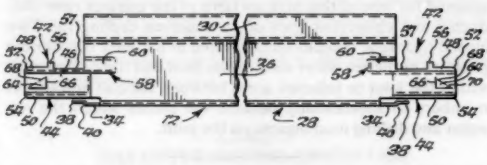
The structural assembly disclosed herein includes a panel, a structural member overlying an aperture in the panel, and a sheet metal, deformable clip or "blind fastener" interconnecting the structural member and the panel. The clip is formed from a strip of sheet metal having a central head portion secured to the structural member, and leg portions first bowed inwardly and converging together opposite the head portion, and thence defining a pair of generally V-shaped portions extending through the aperture having distal ends overlying the panel surface and forming opposed channels grippingly embracing the marginal edges of the panel aperture upon deformation of the clip, to retain the structural member securely against the panel.

3,746,379

LOCKING CONNECTION FOR SUPPORTING GRID SYSTEMS

Gale E. Sauer, Williamsville, N.Y., assignor to Flangeklamp Corporation, Buffalo, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,893
Int. Cl. F16b 7/22
U.S. Cl. 287—189.36 A 7 Claims



A first support member having a web with a slot therein and a second support member having a web upstanding from a pair of laterally extending support flanges and a locking connector formed integral with the web and extending axially therefrom for insertion in the slot. The connector has a resiliently yieldable locking finger struck out from the body of the connector and bent along a fold line inclined relative to the longitudinal axis of the connector.

3,746,380

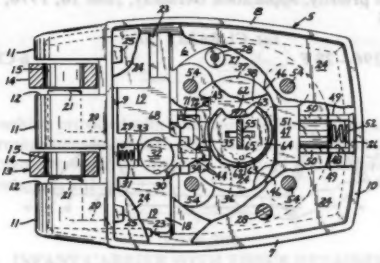
CROSS BOLT DEADLOCK

Henry Kartarik, White Bear Lake, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Int. Cl. E05c 1/06
U.S. Cl. 292—117 1 Claim

A housing arranged to be mounted on a door hinged in a door frame, the housing having a cross bolt mounted therein for movement generally parallel to the adjacent edge of the door toward and away from locking engagement with a lug portion of a strike mounted on the door frame. The cross bolt is releasably held against movement by engagement of a moveable plunger thereon with a pair of spaced portions of

the housing, and moved between locked and unlocked positions by a cam journalled in the housing, the cam engaging the

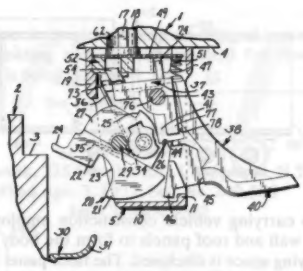


plunger to move the same out of engagement with the engaged portion of the housing. A lock bolt is provided to prevent movement of the cross bolt by said cam.

3,746,381
DOOR LATCH MECHANISM

Gregory R. Colombo, Stillwater, and Russell W. Waldo, St. Paul, both of Minn., assignors to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Sept. 23, 1971, Ser. No. 182,960
Int. Cl. E05c *3/24*
U.S. Cl. 292—216 **4 Claims**



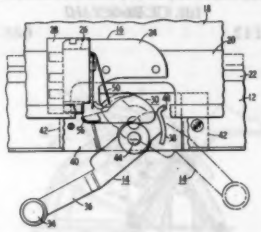
A door latch having a rotary latch bolt journalled in a casing secured to a door for engagement with a fixed strike on a door frame. The latch bolt is yieldingly biased toward an unlatched position relative to the strike, and is formed to provide a ratchet that is engaged by a cooperating pawl on a latch actuator to be held in a latched position in engagement with the strike. A locking device, mounted in the casing, is operatively connected to the actuator by a link, and is operative to restrain movement of the actuator in a direction to unlatch or release the rotary latch bolt for movement to its strike released position.

3,746,382
LATCH ARRANGEMENT FOR APPLIANCE

Charlie L. Hancock, Grove City, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Int. Cl. E05c *3/04*
U.S. Cl. 292—241 **7 Claims**

A latch arrangement for a dishwasher door in which the engaging faces of the pivotal bolt mounted on the door, and the strike mounted on the tub, have arcs which are related in a fashion that during that portion of the latching in which significant resistance to compression of the door gasket occurs,

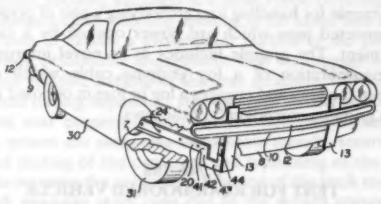


the gasket compressing force has a generally front-to-rear direction to prevent undue shifting of the door in a misaligning direction as the gasket is compressed.

3,746,383
AUXILIARY BUMPER IMPACT PROTECTOR

Thomas L. Davis, Clawson, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y., part interest

Filed Aug. 3, 1971, Ser. No. 168,705
Int. Cl. B60j *11/00*; B60r *19/02*; B61f *19/04*
U.S. Cl. 293—71 R **1 Claim**

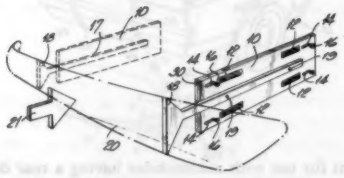


An energy absorbtion mechanism consisting of U-shaped structural members fastened to the automobile frame, and to the automobile bumpers and the bumper guards, which acts to absorb front or rear impact forces to prevent or minimize damage to an automobile and its occupants.

3,746,384
ENERGY ABSORBING AUTOMOBILE BUMPER

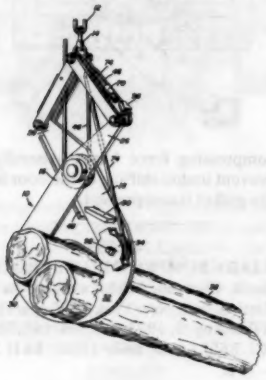
Marion M. Ripley, Baltimore, Md., assignor to The Raymond Lee Organization, Inc., New York, N.Y., part interest

Filed Aug. 23, 1971, Ser. No. 173,880
Int. Cl. B60r *19/06*
U.S. Cl. 293—86 **2 Claims**



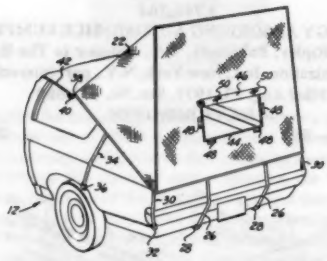
An energy absorbing automobile bumper designed to absorb the shocks for front or rear end collisions and particularly to eliminate impact damage in collisions of up to 15 miles per hour, consisting of longitudinal support members to which the bumper is fastened, said support members being slidably mounted to the automobile frame, with slots in said support members containing compression springs, said compression springs being anchored to the automobile frame so as to limit the longitudinal travel of the support members and to absorb the impact energy of the collision.

3,746,385
CABLE GRIP GRAPPLE
John H. Mitchell, 1005 N. Broadway, Aberdeen, Wash.
Filed Mar. 13, 1972, Ser. No. 233,926
Int. Cl. B66c *1/10*
U.S. Cl. 294—112 10 Claims



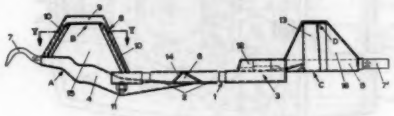
A grapple for handling logs embodying a pair of pivotally interconnected jaws which are power opened by a cable arrangement. The grapple includes as its novel improvement, the incorporation of a log gripping cable which extends between the jaws and engages a log or logs in opposed relation to the gripping components of the jaws.

3,746,386
TENT FOR REAR-DOORED VEHICLE
Frederick W. Woodward, Dearborn Heights, Mich., assignor to Donald Thornber and Bernice B. Thornber
Filed July 17, 1972, Ser. No. 272,587
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 MC 2 Claims



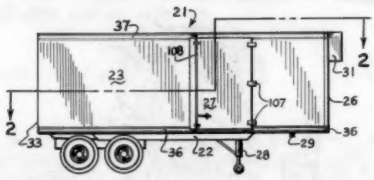
A tent for use with automobiles having a rear door which opens upwardly about a horizontal hinge attached to its top edge. The tent has a prism shape including a pair of substantially parallel triangular ends joined on two sides by quadrangles with the third side being open. One side fits over the top of the open door so that the other side hangs down from the top open end of the door in a substantially horizontal plane with its lower edge joined to the rear of the vehicle adjacent its bumper. The free edges of the ends seal against the rear quarter panels of the car. The ends are secured to the vehicle by elastic straps having hooks on their free edges which clip under convenient points on the car body.

3,746,387
FLOOR ASSEMBLY FOR MOTOR VEHICLES
Kurt Schwenk, Wolfsburg, Germany, assignor to Volkswagenwerk AKG, Wolfsburg, Germany
Filed June 16, 1971, Ser. No. 153,640
Claims priority, application Germany, June 16, 1970, P 20 29 665.5
Int. Cl. B62d *21/02*
U.S. Cl. 296—28 F 6 Claims



A floor assembly for motor vehicles comprising a skeleton frame of longitudinal and transverse supports, a layer of plastic material applied by a reaction injection molding process tightly covering each of said supports for interconnecting them to one another while leaving predetermined portions of said supports uncovered to facilitate installation of various motor vehicle elements, the plastic material also being disposed in sheet form horizontally between the supports to serve as a floor for the assembly.

3,746,388
CARGO CARRYING VEHICLE CONSTRUCTION
Merritt A. Robinson, Marin County, Calif., assignor to Fieldhome Equipment Corporation, San Francisco, Calif.
Filed June 30, 1971, Ser. No. 158,474
Int. Cl. B62d *33/04*
U.S. Cl. 296—28 M 6 Claims



A cargo carrying vehicle construction employing foamed floor, side wall and roof panels to form the body defining the cargo carrying space is disclosed. The floor panel incorporates a rub rail along the edge thereof and the roof panel incorporates a roof edge element, both which are formed for securement to their respective panels by adhesive materials. The rub rail and roof edge element are formed for receipt and securement of a side wall panel thereto, with the same side wall panel being invertible for use on either side of the vehicle. Additionally, the rub rail and roof edge element are formed with openings to allow foaming of the floor and roof panels in place with the respective edge elements acting to contain the foam. Both the rub rail and the roof edge element may be used along the side of the cargo carrier, including a side door, and the front of the vehicle.

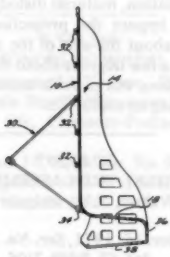
3,746,389
FOLDING SEATS FOR AUTOMOTIVE VEHICLES
Francois Fourrey, Billancourt, France, assignor to Regie National Des Usines Renault, Billancourt, France
Filed Feb. 16, 1971, Ser. No. 115,334
Int. Cl. B60n *1/02*
U.S. Cl. 297—15 8 Claims

This folding seat structure constituting an auxiliary seat is foldable against an element of the body and comprises a backrest with a shaft axis and seat cushion fulcrumed about this axis, and a mechanism of which the component elements fulcrumed about suitably located axes assist in locking the

backrest; at least one pivoted member of the locking mechanism rigid with the backrest and co-acting by means of its cranked end with a retaining member for locking the backrest carries an arm pivoted to a link connecting said arm

to a cushion provided with a fulcrum pin for pivoting said link, the arrangement being such that the backrest is locked when it is actuated towards its operative position, and released when the cushion is lifted.

3,746,390
INFANT CARRIER WITH TISSUE RETAINER
Chester B. Koah, 9150 E. Florence Ave., Downey, Calif.
Filed Dec. 23, 1971, Ser. No. 211,535
Int. Cl. A47c *7/62*
U.S. Cl. 297—192 **3 Claims**

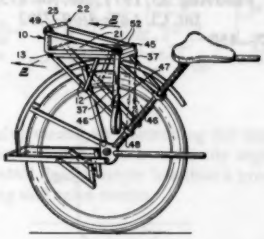


An infant carrier seat including an integral tissue box and used tissue holding receptacle positioned for ready access while the seat is being occupied.

3,746,391
HASSOCK
Warren D. Novak, 325 Douglas Rd., Chappaqua, N.Y.
Filed Apr. 3, 1972, Ser. No. 240,508
Int. Cl. A47c *9/00*
U.S. Cl. 297—193 **10 Claims**

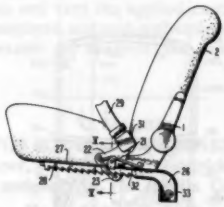
A shoe storage hassock having a lid in the top through which shoes may be inserted into and removed from a rotatable drum contained within the interior of the hassock. The hassock is so sized that a person may sit on the top while simultaneously gaining access to the storage drum through the lid in the top.

3,746,392
CYCLE SADDLE
Lorrayne T. German, 1502 Grove Dr., Richmond, Va.
Filed Nov. 17, 1971, Ser. No. 199,412
Int. Cl. B62j *1/20*
U.S. Cl. 297—380 **5 Claims**



A seat structure for ready attachment and detachment from the luggage carriers of cycle type vicles providing a padded seat and back rest maintained in operative relation by strap means detachably secured to ring connectors disposed at the forward corners of the seat and encircling the back rest adjacent its upper edge so as to be inclined downwardly and forwardly past the thighs of the occupant to provide centering side support. The seat structure be comprised of a one piece foam rubber padding enclosed in a stout fabric covering having an elongated pad inserting opening in the lower face of the seat portion to expose a protuberant portion of the padding for intimate deformable engagement with the luggage carrier to obviate relative shifting of the seat structure and luggage carrier and having dependent stirrup straps fixedly secured to the front seat corners to support the occupant's feet and slidably mount the strap ring connectors thereby assurring a balanced seating of the occupant and tensioning of the strap means to increase the supporting function of the back rest and the thigh engaging strap runs due to the weight component acting through the stirrup straps.

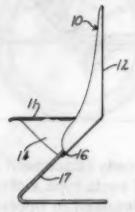
3,746,393
SAFETY BELT INSTALLATION
Rudolf Andres; Erwin Kolle, both of Sindelfingen, and Rudolf Binder, Schonaich, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturk, Germany
Filed Aug. 6, 1971, Ser. No. 169,613
Claims priority, application Germany, Aug. 6, 1970, P 20 39 103.1
Int. Cl. A62b *35/60*
U.S. Cl. 297—385 **12 Claims**



A safety belt installation for vehicles, especially for motor vehicles with adjustable seats, in which at least one belt section is connected with the body or the frame of the vehicle by means of an anchoring fitting of which parts thereof are able to follow the adjusting movements of the seat and which is locked in all adjusted positions of the seat by the tensioning of the belt; at least one of the fitting elements includes a toothed rack while another fitting element is pivotally connected at the seat whereby during tensioning of the safety belt, a fitting ele-

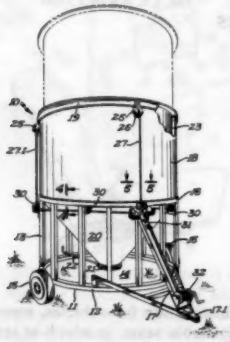
ment engages into the toothed rack against the force of a disengaging spring.

3,746,394
SEAT AND BACK STRUCTURE FOR CHAIRS
John A. Speidel, 7955 Upper River Rd., Mainesville, Ohio
Filed Aug. 23, 1971, Ser. No. 173,800
Int. Cl. A47c *3/00, 7/02*
U.S. Cl. 297—458 **6 Claims**



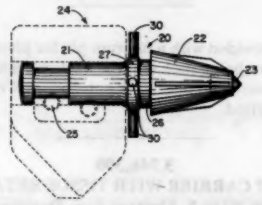
A chair having seat, back and connecting portions such as arms, preferably formed of a single sheet of bendable or foldable material. All surfaces of the chair are of the types of those ruled surfaces which are developable. Such surfaces are either: (*a*) plane; or, (*b*) single-curved surfaces, namely, cylindrical, conical and convolute; or, (*c*) combinations of (*a*) and (*b*). The entire structure is characterized by the absence of any surfaces which are nondevelopable, whereby starting with a flat, bendable or foldable, integral sheet of material a chair may be formed without stretching, crumpling or tearing the sheet. The thus formed structure will receive surface treatment material in sheet form which will lie thereon in mutual conformity therewith, likewise without stretching, crumpling or tearing.

3,746,395
MOBILE STORAGE BIN
Jay L. McClaren, P.O. Box 559, Litchfield, Minn.
Filed Oct. 15, 1971, Ser. No. 189,652
Int. Cl. B60p *1/56;* **B62d** *33/08*
U.S. Cl. 298—27 **4 Claims**



A mobile storage bin with ground travel wheels and to be attached to a towing vehicle, and having a telescoping sidewall section extendible upwardly to increase the volume capacity of the bin; and a cable and winch apparatus for raising and lowering the telescoping wall sections.

3,746,396
CUTTER BIT AND METHOD OF CAUSING ROTATION THEREOF
Frederick J. Radd, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Dec. 31, 1970, Ser. No. 103,211
Int. Cl. E21c *35/18*
U.S. Cl. 299—10 **13 Claims**



A method and apparatus for turning a cutter bit in a continuous mining machine by providing one or more projections coupled to the bit having sufficient length so that when the cutter bit is in operation, material dislodged by the cutter bit, when falling, will impact the projections. The impact will generate a torque about the axis of the cutter bit causing the cutter bit to rotate a few degrees about the axis. Continual impact of the projections will provide continuous turning of the bit thereby increasing its useful life.

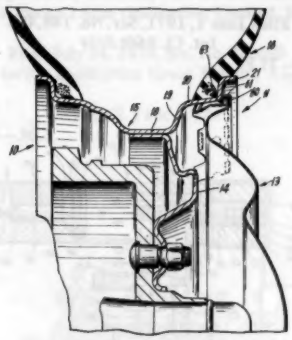
3,746,397
WHEEL TRIM ASSEMBLY
Herbert Buerger, Walton, N.Y., assignor to Del-Met Corporation, Walton, N.Y.
Filed Dec. 15, 1971, Ser. No. 208,154
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 R **16 Claims**

A wheel trim, such as a wheel cover, is attached to an annular ring. Clips are mounted on said ring in angularly spaced relation, for slight or limited self-adjusting, circumferential and radial movement. Each clip has a central hook to engage the upper surface of a flange of a tire receiving rim, and a pair of side hooks to engage the undersurface of said flange.

3,746,398
WHEEL TRIM AND LOCK RING ASSEMBLY
Herbert Buerger, 129 North St., Walton, N.Y.
Division of Ser. No. 36,336, May 11, 1970, Pat. No. 3,676,919.
This application Nov. 29, 1971, Ser. No. 202,834
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 R **8 Claims**

The lock ring is snapped into locking engagement with a wheel cover or other wheel trim. Mastic sealer material is ap-

plied to the snap in connection between the wheel and trim. Once the two pieces are locked together they can only be

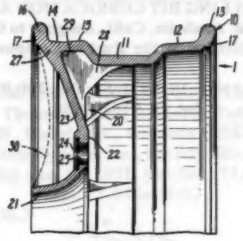


taken out with considerable difficulty. The sealer material is for the purpose of quieting squeaking and preventing relative rotation between the two pieces.

3,746,399
MONOBLOC WHEEL

Henri Verdier, Beauregard-L'Eveque, France, assignor to Compagnie Generale Des Etablissments Michelin raison socials Michelin & Cie, Clermont-Ferrand (Puy-de-Dome), France

Filed Dec. 16, 1970, Ser. No. 98,655
Claims priority, application France, Dec. 26, 1969, 6945163
Int. Cl. B60b *3/06*
U.S. Cl. 301—65 **5 Claims**



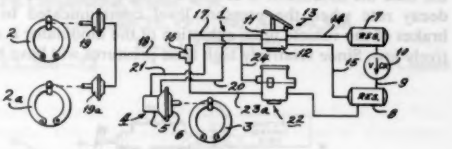
A monobloc wheel has a well-base rim and a disc. The disc comprises a central portion flared in a direction that is axially in and radially out, an intermediate portion lying in the plane of attachment to the hub, and an outer portion flared in a direction that is axially out and radially out. The outer portion is joined to the rim near a rim flange so that the disc buttresses the rim while constituting an extension thereof.

3,746,400
BRAKE SYSTEM

Oliver B. Cruse, Florissant, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Division of Ser. No. 117,958, Feb. 23, 1971. This application Apr. 3, 1972, Ser. No. 240,456
Int. Cl. B60t *13/46*
U.S. Cl. 303—9 **16 Claims**

A brake system for a vehicle having an axle set of brakes adapted for energization in response to spring setting pressure released brake actuators connected therewith is provided with an operator actuated application valve for selectively venting fluid pressure from said brake actuators to effect spring set energization of said axle set of brakes, and an emergency brake valve is also responsive to the selective venting of the fluid pressure from said brake actuators to apply fluid pressure to the other axle set of brakes of said vehicle and effect fluid pressure energization thereof. The emergency brake valve is

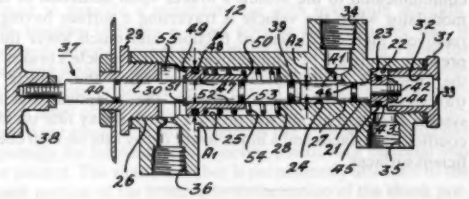


provided with valve means for controlling the application of fluid pressure therethrough, and a resiliently urged member responsive to control fluid pressure less than a predetermined value for actuating said valve means.

3,746,401
CONTROL VALVE AND SYSTEM

George W. Stearns, St. Louis, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Apr. 27, 1971, Ser. No. 137,798
Int. Cl. B60t *15/16*
U.S. Cl. 303—71 **24 Claims**



A brake system for a vehicle having a brake adapted for energization in response to a spring setting pressure released actuator connected therewith is provided with a push-pull type control valve which is selectively operable to control the application and exhaustion of emergency pressure to and from said brake actuator to effect the de-energization and energization of said brake, and said control valve is automatically actuated in response to a predetermined low service pressure subjected thereto to exhaust the emergency pressure from said brake actuator to effect the spring set energization of said brake. The control valve is provided with resiliently urged means automatically actuated in response to a predetermined low service pressure acting thereon to isolate the emergency fluid pressure applied through said control valve from that supplied thereto and vent the applied emergency fluid pressure to the atmosphere, and said resiliently urged means is also selectively operable to override the automatic actuation thereof.

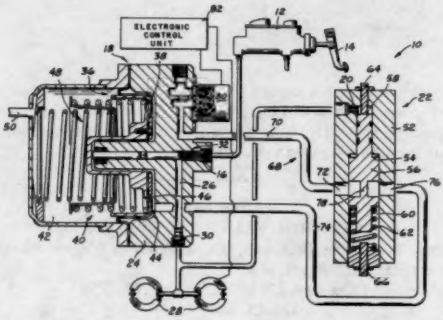
3,746,402
REGULATOR FOR ADAPTIVE BRAKING SYSTEM

George B. Hickner, and Richard T. Hendrickson, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 29, 1972, Ser. No. 267,321
Int. Cl. B60t *8/00*
U.S. Cl. 303—21 F **12 Claims**

An adaptive braking system is disclosed which includes the usual modulator operated by a fluid motor which is responsive to an output signal from an electronic control unit to relieve braking pressure in the vehicle's brakes. The system further includes a valve which is responsive to the fluid pressure level actuating the vehicle's brakes to vary the rate at which the braking pressure communicated to the vehicle's brakes is re-

lieved by controlling the rate at which fluid pressure is communicated to the fluid motor which operates the modulator. This feature provides a relatively low decay rate when the braking pressure communicated to the brake of the vehicle at the time the modulator is actuated is high, and a much faster decay rate when the pressure level communicated to the brakes of the vehicle upon actuation of the modulator is relatively low. Since relatively high fluid pressures will have been



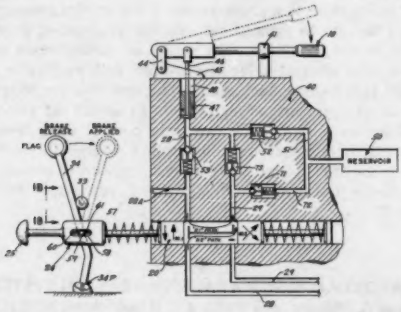
communicated to the vehicle's brakes upon actuation of the modulator when the vehicle is traversing a surface having a relatively high coefficient of friction, and much lower fluid pressure levels will be communicated to the vehicle's brakes at the time the modulator is actuated when the vehicle is traversing low coefficient surfaces, the adaptive braking system disclosed herein will provide a high decay rate on low coefficient surfaces and a much lower decay rate on high coefficient surfaces.

3,746,403

HYDRAULIC BRAKES

Roger D. Jones, Ramsey, N.J., and Peter B. Burnham, Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 185,958
Int. Cl. B60t *17/16*
U.S. Cl. 303—89 **11 Claims**



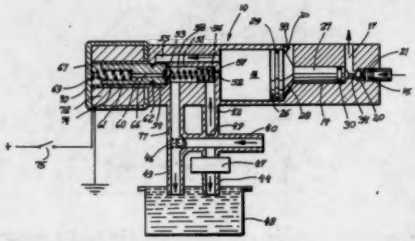
A brake is applied by a fluid under pressure, the establishment of sufficient pressure to apply the brake being visably indicated. Mechanical means for holding the brake in its engaged position is actuated or energized upon slight expansion of a spring member which is part of the system for transmitting the brake force; the spring is allowed to expand, after the brake is engaged, by a purposeful bleed in the fluid system. If the mechanical lock fails to hold, a visual indication is given of this failed event. While the brake is held engaged mechanically, it is released by fluid under pressure.

3,746,404

BRAKE CONTROL DEVICE

Carmeli Adahan, 1627 Bonita Ave., Apt. No. 6, Berkeley, Calif.

Filed June 1, 1971, Ser. No. 148,492
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 F **9 Claims**



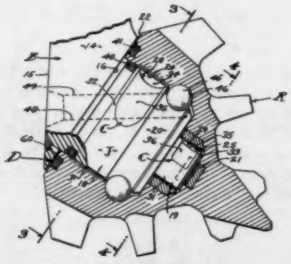
A brake control device for regulating the application of brake fluid pressure to an hydraulic cylinder. An hydraulic flow controller comprising a piston-plunger assembly is alternately controlled by a secondary hydraulic system driven by an available hydraulic source, such as a power steering unit, and an externally mounted solenoid. The secondary hydraulic system incorporates a fail safe system which prevents a failure of fluid pressure in the secondary system from disabling the associated hydraulic braking system.

3,746,405

WELL DRILLING BIT LUBRICATION AND SEAL

Russell L. Welton, Anaheim, Calif., assignor to Globe Oil Tools Company, a division of the Rucker Company, Los Nietos, Calif.

Filed Nov. 18, 1971, Ser. No. 200,075
Int. Cl. F16c *33/66*
U.S. Cl. 308—8.2 **26 Claims**



A journal bearing lubrication means and a seal cooperatively combined therewith to maintain lubrication throughout the useful life of the roller cutter of a well drilling bit, to the exclusion of foreign materials entering therein from the drilling fluids and surrounding earth formations. A journal bearing of right cylinder form is provided, characterized by the formation of a strategically placed recess, or recesses therein and all without subtracting from the load carrying capabilities of the bit; the assembly being retained in working condition by a single element combined with the lubrication means and assuring proper axial placement of the roller cutter.

3,746,406

JOURNAL BEARINGS

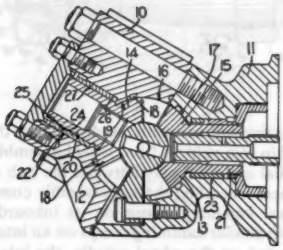
Richard Joseph Ifield, Beecroft, New South Wales, Australia, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 24, 1970, Ser. No. 58,058

Claims priority, application Great Britain, Aug. 14, 1969, 40,632/69

Int. Cl. F16c *33/74*

U.S. Cl. 308—36.3 4 Claims



A journal bearing for a shaft includes a pair of axially displaced seals between the shaft and its housing, one of the seals lying in a plane inclined to the normal to the shaft axis. A fluid pressure introduced between the seals applies a couple to the shaft which opposes an externally applied couple tending to move the axis of the shaft with respect to the axis of a bore in the housing.

3,746,407

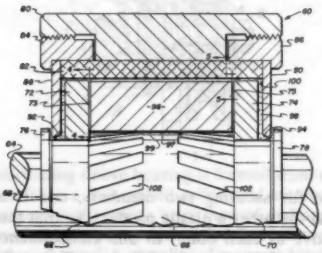
FERROHYDRODYNAMIC LOW-FRICTION BEARING

John C. Stiles, Thousand Oaks; Robert H. Tuffias, Costa Mesa, and Roger W. Blakely, Jr., Granada Hills, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 13, 1971, Ser. No. 171,691

Int. Cl. F10c *33/82*

U.S. Cl. 308—36.3 20 Claims



A self-contained, full-film hydrodynamic bearing utilizing (1) the hydrodynamic properties of a ferrofluid (colloidal suspension of magnetic particles) to produce support pressures in the bearing by an applied viscous pumping action, and (2) the magnetic properties of the ferrofluid to retain the fluid within the bearing.

3,746,408

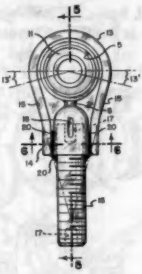
STAMPED BEARING ASSEMBLY

Vincent C. Wachter, Milford; Joseph R. Keller, Fairfield, and Frederick J. Feldmann, Stratford, all of Conn., assignors to MPB Corporation, Keene, N.H.

Filed July 21, 1971, Ser. No. 164,508

Int. Cl. F16e *23/00*

U.S. Cl. 308—72 22 Claims



A stamped bearing assembly consisting of two sheet metal housing halves crimped together and having a pocket for receiving a bearing member. The housing halves are dimensioned to provide a minimum size with maximum strength. The housing includes a head portion in which the ball is received within a pocket and a shank portion having a bore for receiving a shank member or for use in attachment to a connecting member not formed as part of the assembly. An internal channel connects the pocket with the bore. The construction of the channel both strengthens the housing and provides a passage for lubricating or injecting plastic race material into the pocket. The shank member is permanently attached to the shank portion of the housing by deformation of the shank portion of the housing against the shank member.

3,746,409

SUBSTANTIALLY RIGID BEARING FOR ROTARY BODIES

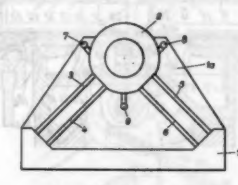
Manfred Heiland, Hahn/Pfungstadt, Germany, assignor to Firma Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany

Filed Nov. 19, 1971, Ser. No. 200,409

Claims priority, application Germany, Aug. 20, 1971, P 21 41 792.5

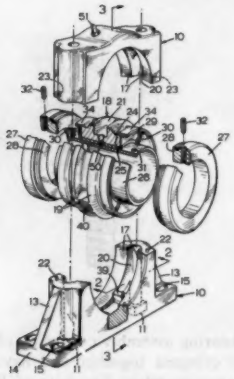
Int. Cl. F16c *35/00*

U.S. Cl. 308—15 11 Claims



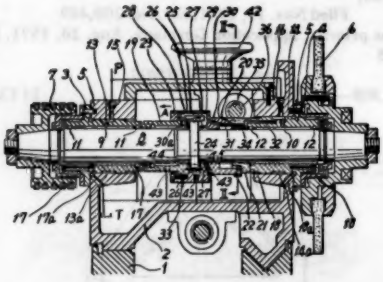
A substantially rigid bearing for rotating bodies is anchored with rods to a base or foundation, whereby the rods extend in a common plane perpendicularly to the main bearing axis. The rods restrain the bearing housing or head from rotational movement about said axis, as well as from any radial movements relative to said axis but permit a wobbling movement which causes forces in the direction of said main bearing axis. To control these forces, a plurality of spring means are provided extending substantially in parallel to said main axis and connecting said bearing housing or head to a rigid support without interfering substantially with said wobbling movement.

3,746,410
JOURNAL BEARING
John F. Cameron, Mississauga, Ontario, Canada, assignor to Hatch Associates Ltd., Toronto, Ontario, Canada
Filed Aug. 10, 1971, Ser. No. 170,451
Int. Cl. F16c 23/00
U.S. Cl. 308—72 8 Claims



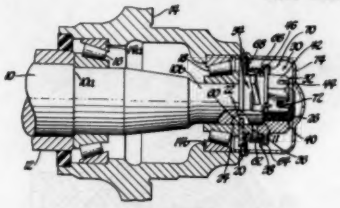
A journal bearing is disclosed having a fully sealed bearing surface with provision for fluid cooling and pressure lubrication. The bearing can accommodate shaft misalignment and can embody a wide variety of mounting configurations.

3,746,411
SPINDLE HEAD DEVICE WITH SPINDLE AXIAL ADJUSTING MEANS
Makoto Kikuchi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Japan
Filed Sept. 28, 1970, Ser. No. 76,053
Claims priority, application Japan, Sept. 27, 1969, 44/92272
Int. Cl. F16c 17/04
U.S. Cl. 308—168 7 Claims



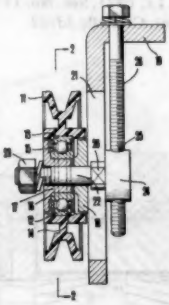
A spindle head device is equipped with means for axially adjusting the position of the spindle. The spindle is rotatably mounted in radial bearing members, and is axially supported in a thrust bearing assembly by means of static pressure generated in bearing pockets provided therein. The thrust bearing assembly is connected to an adjusting hand wheel through gear mechanism for adjusting the position of the spindle through the thrust bearing assembly. An annular chamber is formed between one end of the thrust bearing assembly and the radial bearing member and is connected to a fluid pressure source, whereby the thrust bearing assembly is pushed in one axial direction for maintaining the spindle at the desired position.

3,746,412
SELF-ADJUSTING NUT ASSEMBLY FOR WHEEL RETAINMENT
Charles N. Hay, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed July 6, 1971, Ser. No. 159,756
Int. Cl. F16c 23/08
U.S. Cl. 308—207 A 3 Claims



A self-adjusting nut assembly used to adjust the race-bearing relationship in a vehicle front wheel assembly in order to eliminate radial and axial play between the hub and the spindle of the wheel assembly, the nut assembly comprising a nut having integral camming ramps on its inboard face which cooperate with similar camming ramps on an interior member slidably mounted on the wheel spindle, the interior member being maintained in assembly with the nut within a shroud with a coil spring secured to the nut and the interior member to produce the desired rotational movement between the nut and the interior member which results in these elements being spread apart.

3,746,413
ROTATION PREVENTIVE DEVICE
Hideo Nishikawa, Osaka, Japan, assignor to Wada Seiko Kabushiki Kaisha, Osaka-fu, Japan
Filed Mar. 13, 1972, Ser. No. 234,083
Claims priority, application Japan, Mar. 25, 1971, 46/22291
Int. Cl. F16c 35/06
U.S. Cl. 308—236 5 Claims



A device for securing two members, one is a metallic product and the other a plastic product, so that they can not rotate relative to each other. In one embodiment a groove which is eccentric to the axis of the metallic product is provided on the outer cylindrical surface of the metallic product and the inner cylindrical surface of the plastic product is tightly fitted to the outer cylindrical surface of the metallic product in such a manner that a part of the inner cylindrical surface of the plastic product is filled in the groove. In another embodiment a groove which is eccentric to the axis of the metallic product is provided on the inner cylindrical surface of the metallic product and the outer cylindrical surface of the plastic product is tightly fitted to the inner cylindrical surface

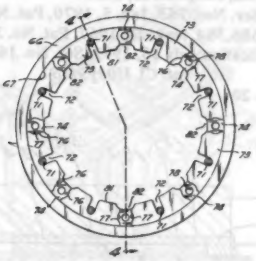
of the metallic product in such a manner that a part of the outer cylindrical surface of the plastic product is filled in the groove.

3,746,414

WATER LUBRICATED STAVE BEARING

John R. Sudyk, Huntsburg, and Donald W. Finefrock, Burton, both of Ohio, assignors to The Johnson Rubber Company, Middlefield, Ohio

Filed Oct. 29, 1971, Ser. No. 194,770
Int. Cl. F16c *27/06*
U.S. Cl. 308—238 **23 Claims**



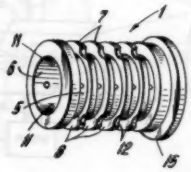
A demountable water lubricated rubber stave bearing is disclosed. Two different stave mounting systems are illustrated which can be used independently or in combination. One system employs rods which mechanically position the staves in the housing, support the staves along their length and secure removable end plates in position. The other mounting system employs deformable elastomeric inserts which are prestressed and produce a peripherally directed force on the staves. The structure is arranged to accommodate both axially directed and peripherally directed expansion and contraction of the stave material.

3,746,415

SELF-LUBRICATING SLEEVE BEARING

John B. Thomson, Manhasset, N.Y., assignor to Thomson Industries, Inc., Manhasset, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,273
Int. Cl. F16c *33/66*
U.S. Cl. 308—240 **17 Claims**



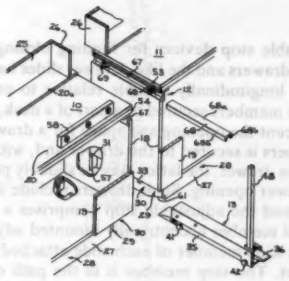
A self-lubricating sleeve bearing is formed from a moldable plastic material as a thin-walled cylindrical member hasing a bearing surface on the inside bore thereof and a plurality of circumferentially extending thin-walled fins located along the outside surface thereof. A plurality of separate lubrication distribution openings provided in the cylindrical member between the circumferentially extending fins or, alternatively, a plurality of axially-extending slots interconnecting two or more of the fins, meter the lubricant to the bearing surface. Lubricant equalization apertures provided in the circumferentially extending fins interconnect the lubricant-carrying annular spaces therebetween throughout the length of the bearing. The bearing may be assembled from sections or modular segments. Integral and/or separate sealing can be incorporated with the bearing. The bearing also may be manufactured with a longitudinally extending compensation gap to permit circumferential expansion of the bearing under operating conditions.

3,746,416

MODULAR FURNITURE SYSTEM AND MEANS FOR MANIPULATING AND CONNECTING COMPONENTS THEREOF

Russell M. Sasnett, Louisville, Ky., and James E. Stiner, New Albany, Ind., assignors to General Electric Company, Louisville, Ky.

Filed July 1, 1971, Ser. No. 158,849
Int. Cl. A47b *53/00*; F16b *12/00*; A47f *3/00*
U.S. Cl. 312—198 **5 Claims**



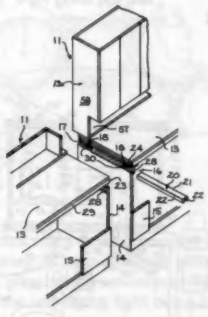
A pre-fabricated system comprising a plurality of modular cabinet components or sub-assemblies arrangeable in various selectable combinations to furnish a living area, such as a kitchen, is provided with means for rapidly installing the modular components in side-to-side relationship and fastening them together to form a self-supporting integrated structure.

3,746,417

FURNITURE SYSTEM HAVING MEANS FOR CONNECTING SUB-ASSEMBLIES THEREOF

Russell M. Sasnett, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 1, 1971, Ser. No. 158,850
Int. Cl. A47b *53/00*; F16b *12/00*
U.S. Cl. 312—198 **2 Claims**



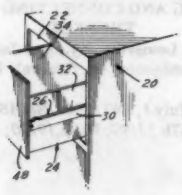
In a unitized furniture structure wherein prefabricated components or sub-assemblies are arranged in side-to-side abutment to form a free-standing integral unit, means are provided for rapidly fastening and locking adjacent sub-assemblies together to complete the structure.

3,746,418

ADJUSTABLE STOPS FOR DRAWER SLIDES

Lloyd L. Barber, Jr., Santa Ana, Calif., assignor to Standard Precision, Inc., Santa Fe Springs, Calif.

Filed Mar. 22, 1971, Ser. No. 126,474
Int. Cl. A47p *88/00*
U.S. Cl. 312—348 8 Claims



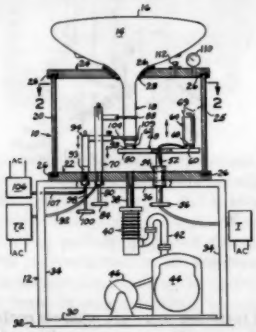
Adjustable stop devices for limiting closing movement of slides for drawers and the like. Drawer slides have two or more members longitudinally slidable relative to each other, with one of the members secured to a part of a desk, cabinet, or the like, adjacent the opening and space for a drawer. Another of the members is secured to the drawer and, with slides at both sides of the drawer, the latter may be slidably pulled or pushed in the drawer opening. Such drawers include a front member or panel and the adjustable stop comprises a noise damping cylindrical member eccentrically mounted adjacent the front end of ths slide member of each slide attached to each side of the drawer. The stop member is in the path of a part of the other slide member and is adapted to be struck by the roller at the front end of said other slide member when the drawer is pushed to its innermost position. By loosening the attaching screw on which the stop member is disposed, the latter may be rotated to adjust the point of contact of the stop member with said roller of said slide member. By thus adjusting the cylindrical, eccentrically mounted stop member, the telescoping of the slide members can be stopped at a point whereat the front panel of the drawer will not strike any part of the desk or cabinet, thereby eliminating or minimizing noise and preventing damage to either the front panel of the drawer or adjacent portions of the desk or cabinet when the drawer is closed.

3,746,419

METHOD AND APPARATUS FOR REBUILDING TELEVISION PICTURE TUBES

Homer E. Hill, Duncan, Okla., assignor to Marvin R. Morgan, Duncan, Okla., a part interest

Filed Sept. 7, 1971, Ser. No. 178,236
Int. Cl. H01j *9/50*
U.S. Cl. 316—2 4 Claims



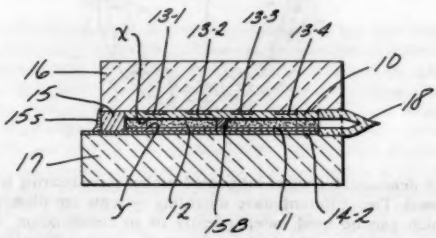
A vacuum pump evacuated chamber supports a cathode-ray television picture tube and is sealed around the neck thereof. Manually operated control means projecting into the vacuum chamber through an end wall thereof removes the previously cut off portion of the television tube neck containing the electron gun, positions a new electron gun in place, bombards the cathode, reseals the televison tube neck and ages the rebuilt tube.

3,746,420

MANUFACTURE AND OPERATION OF GAS DISCHARGE PANEL

Theodore C. Baker, Toledo; Wolfgang W. Bode, Sylvania; Richard G. Mathias, Toledo; James F. Nolan, Sylvania, and Lawrence V. Pfaender, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. Nos. 783, Jan. 5, 1970, Pat. No. 3,614,511, and Ser. No. 686,384, Nov. 24, 1967, Pat. No. 3,499,167. This application July 15, 1971, Ser. No. 163,043
Int. Cl. H01j *9/38*
U.S. Cl. 316—20 2 Claims



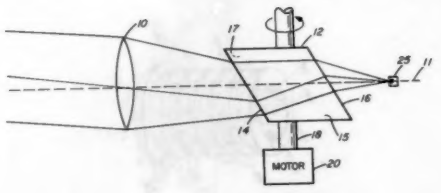
There is disclosed the manufacture and operation of a gas discharge display/memory panel having a pair of opposed support members carrying conductor arrays with an inorganic dielectric coating on the conductor arrays, and an ionizable gas confined between the opposed dielectric surfaces of the substrate.

3,746,421

MULTIPLE LINE ROTATING POLYGON

John R. Yoder, Westport, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed Oct. 27, 1971, Ser. No. 192,814
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 2 Claims



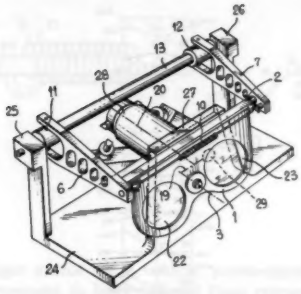
An optical scanning device is provided for producing a multiple line scan. A rotating refractive scanning prism in the form of a polygonal solid having an even number of revolving opposite parallel faces provides a multiple line scan, the lines being separated because the plane parallel pairs of revolving opposite faces are at a small angle to the rotating axis of the prism, which rotating axis is generally perpendicular to the optical axis. The number of lines scanned in such an arrangement is equal to the number of revolving faces on the polygon, and can be increased, in another embodiment of the invention, by providing a plurality of detectors in an array to produce a line raster having a number of lines equal to the number of detectors times the number of revolving sides of the polygon.

3,746,422

APPARATUS TO IMPART A CIRCULAR TRANSLATORY MOVEMENT TO AN ELEMENT SUCH AS A MODULATOR ELEMENT

Jean-Claude Chavany, Chatenay-Malabry, France, assignor to Societe Anonyme De Telecommunications, Paris, France

Filed May 23, 1972, Ser. No. 256,133
Claims priority, application France, June 6, 1971, 7124597
Int. Cl. G02b *17/00*
U.S. Cl. 350—6 3 Claims



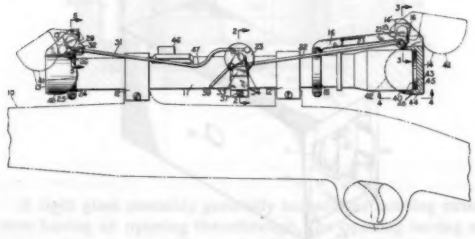
An improved apparatus for imparting a circular translatory movement to an element. This apparatus comprises two lateral parallel arms linked, at one of their ends, on the upper ends of a support, by means of universal joints, and at their other end on an oscillating shaft which is parallel to the support, and a cranked driving member connected to said support and directly mounted on the shaft of a synchronous motor, whereby said support is imparted with a circular translatory movement.

3,746,423

MEANS FOR SIMULTANEOUSLY COVERING OR UNCOVERING BOTH ENDS OF A GUN TELESCOPE

Marvin Mills, 3321 S.E. Third Ave., Camas, Wash.

Filed Feb. 14, 1972, Ser. No. 225,756
Int. Cl. G02b *23/16*
U.S. Cl. 350—65 1 Claim



A pair of protective caps are hingedly mounted on the respective ends of a gun telescope and are interconnected through an intermediate operating member so that they move in unison in opposite directions, thus both either opening or closing simultaneously. The operating member is manually actuated by means of a simple finger lever enabling the user of the gun to swing the protective caps to open position immediately preparatory to firing the gun and subsequently to close the caps whenever the gun is momentarily not in use.

3,746,424

WEATHER-RESISTANT LIGHT TRANSMITTING ISOLATING DEVICE

Wolfgang Hermstein, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 2, 1971, Ser. No. 159,279
Claims priority, application Germany, July 8, 1970, P 20 34 884.9
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B 5 Claims

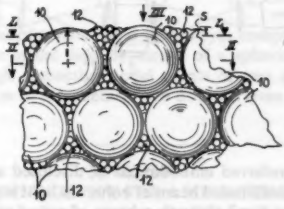
A weather resistant isolating device for transmitting light through a high-voltage field has a trunk of fiber material and at least one glass-fiber bundle suitable for transmitting light contained in the trunk. The trunk and bundle are flexible and a jacket of synthetic material surrounds the trunk and has a plurality of skirts distributed along its length.

3,746,425

REFLECTIVE ROAD MARKING MEANS AND AGGREGATE

Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland

Filed Mar. 31, 1971, Ser. No. 129,921
Claims priority, application Italy, Apr. 7, 1970, 23001 A/70
Int. Cl. G02b *5/12*
U.S. Cl. 350—109 10 Claims



The specification describes a reflective road marking means or traffic aid consisting of an aggregate comprising a multiplicity of reflective glass spheres incorporated into a matrix, the ability to reflect the impinging light being provided by the sphere portions protruding from and exposed at the surface of the traffic aid. Such multiplicity comprises a first plurality of spheres of given essentially uniform diameter and at least a second plurality of much smaller spheres arranged in the interspaces between the first spheres, to improve the population and the exposure of reflective spheres in and at the exposed surface of the traffic aid.

3,746,426

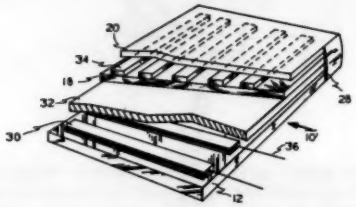
LIQUID CRYSTAL CELL AND METHOD FOR ITS MANUFACTURE

James Vincent Masi, 36 Belle Vale St., Monroe, Conn.

Continuation-in-part of Ser. No. 76,739, Sept. 30, 1970, abandoned. This application Feb. 10, 1972, Ser. No. 225,264

Int. Cl. G02f 1/16

U.S. Cl. 350—160 LC **5 Claims**



A liquid crystal cell and method for its manufacture. The cell has a strip of microglass paper impregnated with liquid crystal material sandwiched between two substrates, each of which has conductive material plated thereon. If coincident selection of a point in the cell is desired, the conductive material on the substrates are in the form of parallel strips with the strip on one substrate being perpendicular to the strips on the other substrate and a layer of non-linear resistance material is deposited over the conductive material on one of the substrates.

3,746,427

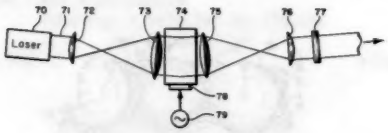
ACOUSTO-OPTICAL SYSTEM WITH SIMPLIFIED OPTICS

Leigh Curtis Foster, Atherton, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 15, 1971, Ser. No. 189,664

Int. Cl. G02b 1/28

U.S. Cl. 350—161 **3 Claims**



In the preferred embodiment of disclosed acousto-optical systems, a collimated beam of coherent light is projected from an entrance pupil through a beam of sound to an exit pupil. The light beam is diffracted by the sound which propagates transversely to the light beam. A cylinder lens is disposed at the entrance pupil to spread the light in a direction that is parallel to the propagation of the sound. Confocal with the cylinder lens is a spherical lens that recollimates the light in the direction of sound propagation while at the same time focusing it in a direction perpendicular to the sound beam. Another spherical lens, located beyond the sound beam, serves to concentrate the diffracted light beam in the direction of sound propagation, and a further cylinder lens system, disposed at the exit pupil and confocal with the second spherical lens, recollimates the light beam.

3,746,428

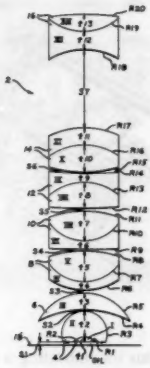
OIL IMMERSION TYPE MICROSCOPE OBJECTIVE

Arthur M. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 793,477, Jan. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 783,078, Dec. 11, 1968, Pat. No. 3,537,772. This application Apr. 17, 1970, Ser. No. 28,248

Int. Cl. G02b 9/00, 21/00

U.S. Cl. 350—214 **7 Claims**



A seven member apochromatic microscope objective having a numerical aperture of substantially 1.30 and a magnification of substantially 100X.

3,746,429

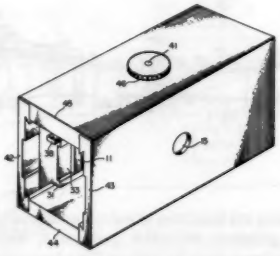
LINEAR VARIABLE LIGHT ATTENUATOR

Abraham Spindel, Los Angeles, and James F. Maas, Simi, both of Calif., assignors to Recognition Systems, Inc., Van Nuys, Calif.

Filed Aug. 5, 1971, Ser. No. 169,202

Int. Cl. G02b 5/00

U.S. Cl. 350—266 **1 Claim**

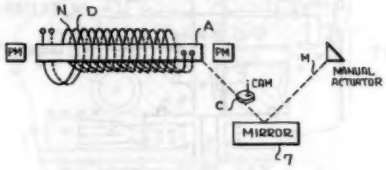


A compact variable light beam attenuator adapted for use in laser system. A pair of optical wedges having flat, parallel surfaces are movably mounted in a light beam path. The wedges are movable with respect to each other along a line having a component normal to the light beam path. The optical density of one wedge increases and that of the other wedge decreases in a given direction along the line of movement. The sum of the optical densities of the areas of the wedges in the light beam path is the effective density of the attenuator.

3,746,430
IMPULSE-OPERATED, DAY-NIGHT, REAR VIEW MIRROR

John W. Brean, and Yervand Mathevosian, both of Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio

Filed Sept. 15, 1971, Ser. No. 180,547
Int. Cl. B60r *1/04*
U.S. Cl. 350—281 8 Claims

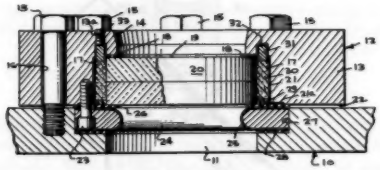


A day-night mirror for a vehicle, photo-electrically controlled in response to light directed from rearwardly of the vehicle and to ambient light, impinging respectively on photocells which via capacitive coupling control the motion of a reversible motor, in the form of a bifilar solenoid, so that only a change in status of the photocells is communicated to the motor in the form of a pulse leaving the motor to be freely actuated manually absent such a pulse, and also reducing current drain in the system.

3,746,431
SIGHT GLASS ASSEMBLY

Charles E. Meginnis, 529½ Nancy St., Charleston, W. Va.

Filed Apr. 29, 1971, Ser. No. 138,546
Int. Cl. G02b *7/00*
U.S. Cl. 350—319 14 Claims

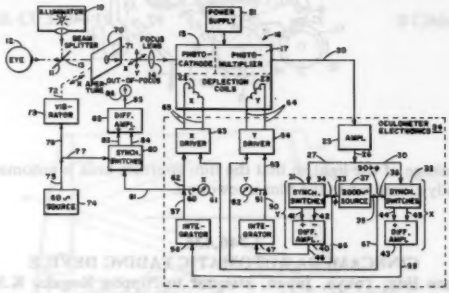


A sight glass assembly generally including a housing structure having an opening therethrough, the opening having an enlarged section providing a shoulder, a face plate having an opening registered with the opening in the housing structure, detachably mounted on the housing structure in opposed relation to the shoulder, a lens disposed tin the enlarged section of the opening in the housing structure and interposed between the shoulder and the face plate, sealing means disposed in the enlarged section of the opening in the housing structure, between the lens and the housing structure, and means engageable with the sealing means for compressing the sealing means against the face plate to expand the sealing means laterally thereby providing a positive seal between the lens and the housing structure.

3,746,432
OCULOMETER FOCUS MONITORING

Kenneth A. Mason, Boston, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 6, 1971, Ser. No. 159,704
Int. Cl. A61b *3/14*
U.S. Cl. 351—6 3 Claims

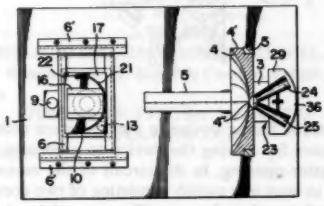


An improved oculometer including a vibrating aperture and associated apparatus for monitoring axial change in the position of the observer's eye with respect to the input lens.

3,746,433
DEVICE FOR MEASUREMENT OF A VISUAL FIELD OF TWO EYES

Katsuji Omoto, No. 28-5, 2-chome, Kobinata, Bunkyo-ku, Tokyo, Japan

Filed Nov. 15, 1971, Ser. No. 198,842
Claims priority, application Japan, Nov. 26, 1970, 45/103683
Int. Cl. A61b *3/02*
U.S. Cl. 351—24 3 Claims



Measurement of a visual field of two eyes comprising measuring two eye visual field by means of a spherical surface passing through respective nodal points of two eyes and a point of fixation in a predetermined distance from said nodal points.

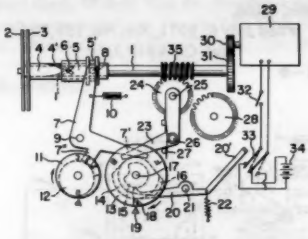
3,746,434
FILM REWINDING DEVICE FOR A MINIATURE MOTION

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 27, 1970, Ser. No. 84,359
Claims priority, application Japan, Oct. 29, 1969, 44/102011 (utility model)
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 5 Claims

This invention presents a film rewinding device for a miniature motion picture camera having a film transfer device and a light shielding device of, for example, the opening angle adjustable type shutter. The film transfer device has a normal-reversal switching device for changing over the direction of the transfer of the film. It is so arranged that when the normal

reversal switching device is changed over to its reverse position, the light shielding device is fully closed to prevent the



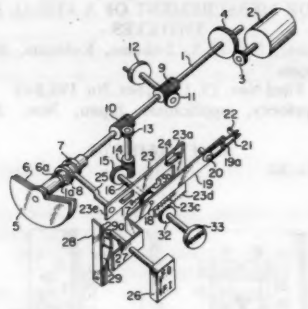
leakage of the light so that the film aperture area is automatically closed when the film is rewound.

3,746,435

CINECAMERA AUTOMATIC FADING DEVICE

Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 30, 1971, Ser. No. 203,184
Claims priority, application Japan, Dec. 4, 1970, 45/120291
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **3 Claims**



An automatic fading device in a cinecamera comprises an electric motor for driving the device to gradually open and close a shutter opening. In the circuit of the motor there is connected at least one switch consisting of two contacts normally closed together by a resilient member. A movable member is provided to force one of the switch contacts into an open position with respect to the other contact when the movable member has closed the shutter opening. A fading operation member is provided to force the said other contact into a closed position with respect to the said one contact when the fading operation member has been moved to its fade-in position.

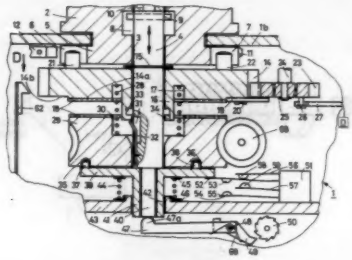
3,746,436

MOTION PICTURE CAMERA WITH FADING MEANS

Gerhard Borner, Musberg, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed Mar. 7, 1972, Ser. No. 232,464
Claims priority, application Germany, Mar. 19, 1971, P 21 13 272.9
Int. Cl. G03b *21/36*
U.S. Cl. 352—91 **40 Claims**

A motion picture camera wherein an axially movable gear which drives the adjusting mechanism for the diaphragm during the making of exposures with fade-out effect is coupled to the camera motor or to a separate motor in response to depression of a button which automatically prepares a switch-actuating member to reverse the camera motor so as to begin with the rearward transport of that portion of the film which was exposed with fade-out effect simultaneously with completion of fade-out exposures. The making of exposures with fade-out effect is terminated automatically because the gear is disengaged from the associated motor in response to exposure of a predetermined number of film frames. The renewed exposure of such film portion, but with fade-in effect, is started in response to depression of the camera release element which causes an entraining member to return the gear into torque-



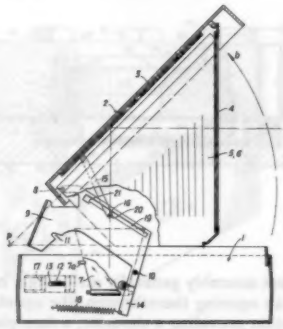
receiving engagement with the associated motor. A control ring on the camera housing can be manipulated by hand to make exposures with fade-out or fade-in effect. The fading mechanism further employs a selector which can be moved to either of two positions in one of which the rearward transport of the film portion which was exposed with fade-out effect begins automatically in response to completion of a predetermined number of fade-out exposures and in the other of which no rearward transport of film takes place so that the exposures with fade-in effect follow the exposures with fade-out effect.

3,746,437

ARRANGEMENT FOR USE IN PROJECTION

Gottfried Pammer, Sudstadt, and Josef Wotdurfter, Vienna, both of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Claims priority, application Austria, Jan. 14, 1970, A 313/70
Filed Jan. 13, 1971, Ser. No. 106,093
Int. Cl. G03b *21/10*
U.S. Cl. 352—104 **5 Claims**



A connecting member is movably connected to a carrying case body and connected to a carrying case cover and operable to move said cover relative to said body between a closed position and a position for use. A mirror is carried by and substantially rigid with said cover and extends substantially parallel thereto. The cover is arranged to define in said closed position with said case body an interface extending substantially in a plane. Said case body, connecting member and cover define for said cover an axis of rotation, which is spaced outwardly from said case body and parallel to said interface and about

which said cover is movable between said closed position and said position for use.

3,746,438

CINE-CAMERA WITH SIMULTANEOUS OPTICAL SOUND-RECORDING DEVICE

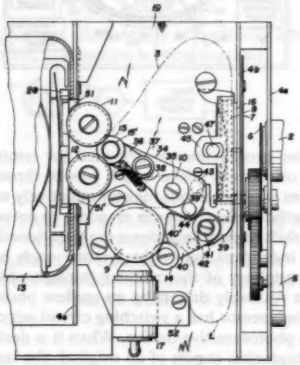
Matsushi Misawa, Yokohama; Isao Kato, Yamato, and Yasutake Kato, Tokyo, all of Japan, assignors to Kabushiki Kaisha Kohka, Tokyo, Japan

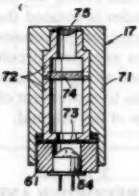
Filed Aug. 30, 1971, Ser. No. 176,061

Claims priority, application Japan, Sept. 4, 1970, 45/77160; Dec. 17, 1970, 45/112410; Dec. 17, 1970, 45/125867; Dec. 28, 1970, 45/119384; Dec. 28, 1970, 45/132135; Dec. 28, 1970, 45/132136

Int. Cl. G03b *1/58*

U.S. Cl. 352—166 7 Claims





In a compact cine-camera with a simultaneous optical sound-recording device, there are provided means for producing a loop locally in the length of a motion picture film and for maintaining the loop at a constant length; means for stabilizing the travel speed of that portion of the loop of film that has passed the film exposing means; an optical sound-recording head with a luminescent diode facing the said stabilizer; and an amplifier means for altering the intensity of the luminance of the diode in accordance with the intensity of the signal of sound to be recorded. The luminant outputs of the diode are projected onto the film strips as they pass the stabilizer to form a sound track on the film. Thus, optical sound-recording is effected on the film simultaneously with the exposure of the film by a compact cine-camera having a simple structure which can be manufactured in a large number at a low cost without requiring any additional complicated equipment.

3,746,439

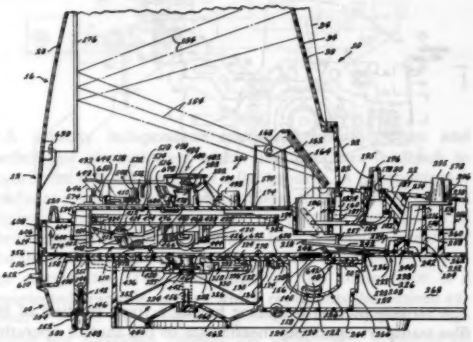
VISUAL-EFFECTS-PRODUCING MEANS IN AN AUDIO-VISUAL TOY

George F. Carabet, Palos Verdes Peninsula; Andrew M. Holland, Los Angeles; Joseph P. Morris, Huntington Beach; William B. Pester, Palos Verdes Peninsula, and Kenneth R. Pinkerton, Westminster, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 29, 1971, Ser. No. 213,243

Int. Cl. G03b *31/06*

U.S. Cl. 353—19 8 Claims



The nature of the projected picture in an audio-visual toy may be changed by manipulating different manual controls to position colored filters or an apertured plate in the path of the light beam or by vibrating a mirror frame which the picture is reflected onto a viewing screen.

3,746,440

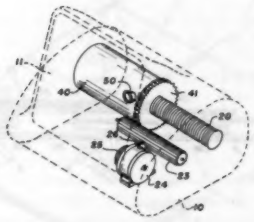
MICROFILMED INFORMATION RETRIEVAL SYSTEM

Barry R. Wiseman, P. O. Box 37, Cassiar, British Columbia, Canada

Filed July 19, 1971, Ser. No. 163,733

Int. Cl. G03b *23/10*

U.S. Cl. 353—108 3 Claims



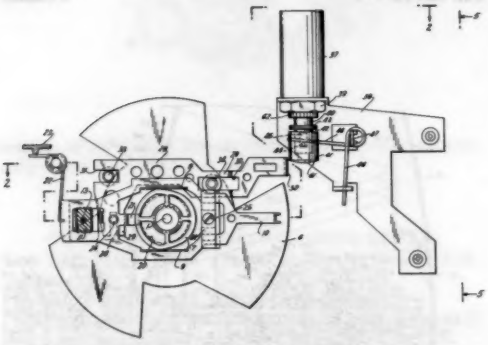
A carrier for microfilmed information which comprises a surface such as a cylindrical surface upon which frames of microfilmed information are arranged in a spiral array. A reader is provided upon which a cylinder may be mounted, the reader comprising a screw threaded shaft co-operating with the cylinder so that the cylinder is rotated about the shaft and moved along it past a projector element.

3,746,441

MOTION PICTURE PROJECTOR

Max Kotler, Montvale, N.J., and Charles Zuckman, White Plains, N.Y., assignors to DeJur-Amsco Corporation, Long Island City, N.Y.

Filed Jan. 21, 1972, Ser. No. 219,744
Int. Cl. G03b 21/38
U.S. Cl. 352—169 10 Claims



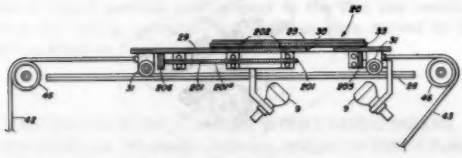
A motion picture projector having a fixed relation of the film transport operating mechanism to the shutter operating means and operating at a normal mode or rate of operation such as to produce continuous motion pictures, control apparatus is provided to alter or change the mode or rate of operation from a normal continuous projection speed to a "-sequence" of motion picture projection, i.e., a slow series of automatically changing still projections, and to produce by stepless, i.e., continuous, increments a change in the intervals of the still projections in any such automatically changing series of still projections. Such changes in the mode or rate of operation is effected without altering the fixed relation between the film transport operating mechanism and the shutter operating mechanism.

3,746,442

ELECTROPHOTOGRAPHIC IMAGING APPARATUS

James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1971, Ser. No. 201,503
Int. Cl. G03g 15/00
U.S. Cl. 355—3 8 Claims



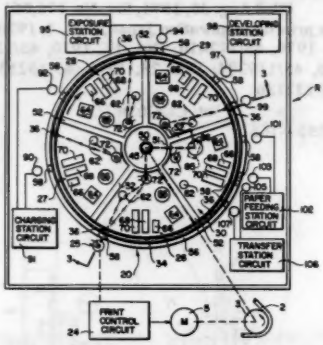
Electrophotographic apparatus in which the scanning assembly for providing light reflections from a document to be reproduced onto an electrophotographic recording surface is provided with a light reflective shield which is automatically moved by inertia between the light source and the document holder during the return scan to ensure the reflection of sufficient light onto the recording surface during the return scan and thereby effectively discharge the recording surface.

3,746,443

MAGNETICALLY CONTROLLED MACHINE PROGRAMMER

Lionel Russell Hickey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 19,644, March 16, 1970. This application Sept. 27, 1971, Ser. No. 184,226
Int. Cl. G03g 15/00
U.S. Cl. 355—14 1 Claim



A machine programmer is provided for controlling work performed on a work piece which moves through separate work stations wherein a shift register selectively energizes and deenergizes the work stations in response to movement of the work. The shift register includes a multisectioned cylinder divided into individual light-tight sectors, each having a slot along the periphery of the cylinder through which light can pass, and is rotatably driven by an endless photoconductive member. Each sector has a switching circuit which includes a lamp and a photosensitive device. When it is desired to make electrophotographic copies of an original, the lamp is turned on by an input signal from an electromagnet adjacent the cylinder which is energized in accordance with the number of copies to be made. As each sector moves along a circular path past the electromagnet, a reed switch is operated to turn on the lamp, whose light by means of a photosensitive device maintains the circuit, and hence the lamp itself, in activated condition. As the cylinder is rotated the light in each lighted sector activates a series of photosensitive devices spaced around the cylinder to energize circuits connected to electrophotographic stations along the path of the photoconductive element in response to movement of the photoconductive element to make copies of the original.

3,746,444

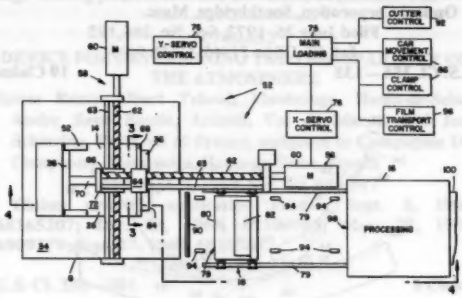
MICROFICHE RECORDER AND PROCESSOR

Rolf D. Kahle, Saratoga; David K. Studley, Santa Clara, and James D. Bryson, Sunnyvale, all of Calif., assignors to Bessemer Securities Corporation, Mountain View, Calif.

Filed Nov. 24, 1971, Ser. No. 201,642
Int. Cl. G03b 27/46
U.S. Cl. 355—28 11 Claims

A microfiche recorder in which a platen is rectilinearly moved over a reference plate having an optical aperture through which images are projected onto film on the platen. A supply of recording film is stored on the platen for movement therewith to prevent film twisting and distortion. The platen moves slidably over the reference plate and vacuum ports in the platen retain the film section being exposed to the platen. When the platen is in its home or starting position, a reciprocating clamp grasps an edge of the exposed film, the vacuum is released and a predetermined length of film is drawn from the platen to thereby automatically reload the platen with fresh film for exposure. As soon as the exposed film section has been fully withdrawn from the platen, a cutter severs it from the remaining film. Thereafter, transport wheels

grasp the film, the clamp releases and the film is transported into a chemical processor for developing so that the exposed



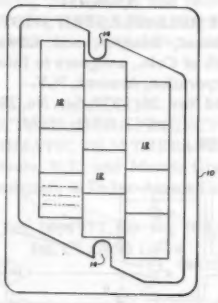
film is ready for use substantially immediately after its exposure while a fresh film section is being exposed.

3,746,445

MATRIX LAYOUT BOARD FOR MAKING MULTI-CHARACTER FILM CHIPS

Barton D. Bobbitt, 2770 Daniel, San Diego, Calif.

Filed Mar. 20, 1972, Ser. No. 236,010
Int. Cl. G03b 27/52
U.S. Cl. 355—40 **6 Claims**



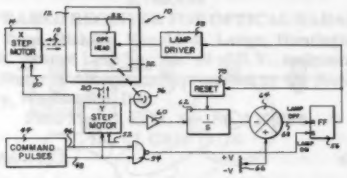
A matrix layout board is made as a scalar enlargement of the film chip to be fabricated and has a plurality of identical size sections equal in number to the number of characters on the film chip. A plurality of interchangeable section plates bearing alpha numeric and symbolic characters are configured to fit in any selected section of the board. Means for retaining a selected combination of the section plates on the board are provided and a camera is positioned to form an image of the board at an image plane on the film of the camera providing a size reduction ratio for producing the image in a size equal to the desired size of the film chips to be fabricated. The film is exposed in successive portions according to the number of identical film chips desired having the particular combination of selected alpha-numeric and symbolic characters positioned on the layout board. The film is then processed and cut to the desired size and outside configuration of the final film chips.

3,746,446

EXPOSURE CONTROL SYSTEM AND METHOD FOR PHOTOPLOTTERS

Joseph J. Sliwkowski, Framingham, Mass., assignor to Computervision Corporation, Burlington, Mass.

Filed May 5, 1971, Ser. No. 140,350
Int. Cl. G03b 27/78
U.S. Cl. 355—68 **4 Claims**



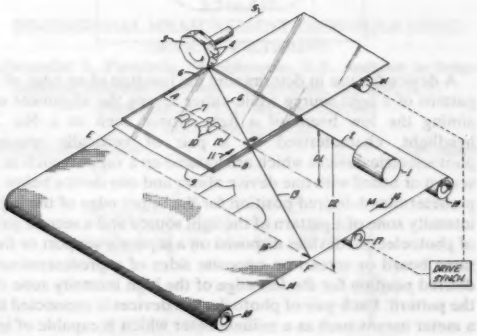
A velocity independent exposure control system and method for photoplotters which uses exposure feedback to control the ON-OFF cycle of a light source. A photodetector produces a voltage that is proportional to the amount of light impinging upon a photosensitive plotting surface. The photodetector output is integrated by a resettable integrator and the output of the integrator is used as one input to a voltage comparator. The other input to the comparator is a preselected, variable voltage which represents the desired exposure. When the integrated photodetector output voltage equals the reference voltage, the comparator produces an equality signal. A light source control circuit that is responsive to the comparator equality signal then turns the light source off.

3,746,447

MARKER ENLARGER

William E. Smith, Placentia, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.

Filed July 7, 1971, Ser. No. 160,310
Int. Cl. G03b 27/10
U.S. Cl. 355—84 **3 Claims**



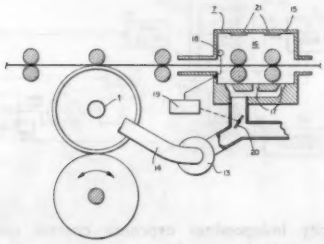
A deflected laser beam can be used to generate a scanning raster for enlarging a moving marker. The enlargement factor perpendicular to the marker motion is dependent upon the geometry of the optics while the enlargement factor in the dimension parallel with the direction of motion depends upon the relative speed between the marker and copy material.

3,746,448

APPARATUS FOR PRODUCING POSITIVE OR NEGATIVE IMAGES ON A LIGHT ACTIVATABLE, THERMALLY DEVELOPABLE, DIAZOSULFONATE REPRODUCTION MATERIAL

Paul Edward Kitch, West Springfield, Mass., assignor to Scott Paper Company, Delaware County, Pa.

Filed Dec. 6, 1971, Ser. No. 204,835
Int. Cl. G03b 27/30
U.S. Cl. 355—106 **6 Claims**



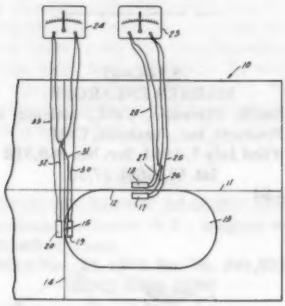
An apparatus for selectively forming either positive or negative images on a light-activatable, thermally developable, diazosulfonate reproduction material. The material is heat treated prior to or subsequent to being passed through a re-exposure station spaced from the exposure station.

3,746,449

HEADLIGHT TESTER

Frederick A. Schick, Springfield, Ill., assignor to Duro Corporation, Springfield, Ill.

Filed Oct. 6, 1970, Ser. No. 78,367
Int. Cl. G01j 1/00
U.S. Cl. 356—121 **4 Claims**



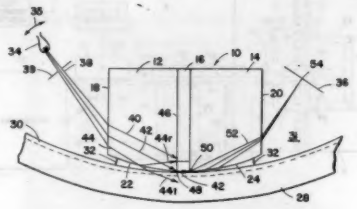
A device for use in determining the location of an edge of a pattern of a light source while either testing the alignment or aiming the low beam of a light source such as a No. 2 headlight, characterized by a pair of vertically spaced photoelectric devices which are located on a support such as a screen or board with one device above and one device below a predetermined desired position for the upper edge of the high intensity zone of a pattern of the light source and a second pair of photoelectric devices disposed on a separate support or the same board or screen on opposite sides of a predetermined desired position for the left edge of the high intensity zone of the pattern. Each pair of photoelectric devices is connected to a meter means such as a milliammeter which is capable of indicating a difference in the output of the two photoelectric devices of each pair. By relatively moving the pattern and the pairs of photoelectric devices either by aiming the headlight or by moving the support for the pairs of photoelectric devices to produce the greatest indication on the milliammeter, the edge, either the upper edge or the left edge of the high intensity zone, is aimed to coincide with the predetermined desired position.

3,746,450

METHOD AND APPARATUS FOR INSPECTING SURFACE TREATED OPHTHALMIC LENSES

Luther W. Smith, Jr., Brimfield, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 26, 1972, Ser. No. 266,193
Int. Cl. G01n 21/46; G01b 9/00
U.S. Cl. 356—135 **19 Claims**



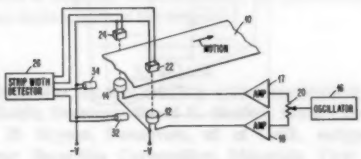
Glass ophthalmic lenses which have been treated by a process of ion exchange provide increased impact resistance and durability. It is necessary that these lenses be inspected to ascertain that the desired penetration of the ion exchange process has occurred prior to dispensing the lenses to the public. This may now be accomplished by introducing into the hardened exterior layer light waves at essentially grazing refraction. Because the hardened outer layer is of compressively stressed nature, the resulting index of refraction is generally higher than that of the interior of the lens. These light waves which were introduced at essentially grazing refraction are confined to the compressively stressed layer and are guided along the surface in a surface wave mode. The surface wave mode energy may be refracted out of the surface layer to provide a positive output signal. If the hardened layer is not present, these rays will not be guided along the surface of the lens but rather will penetrate into the interior of the lens and will provide no output.

3,746,451

HIGHLY RELIABLE STRIP WIDTH GAUGE

Larry L. Croissant, Boulder, and Edward A. Crowther, Lafayette, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,540
Int. Cl. G01b 11/04
U.S. Cl. 356—159 **7 Claims**



The strip width gauge described herein is capable of measuring strips to an accuracy of 50 microinches. In particular, it is applied herein to measuring the width of magnetic tape. The measurements are accomplished by aligning, at each edge of the strip, a light emitting diode on one side of the strip and a photodiode on the other side of the strip. The amount of light reaching the photodiode from its associated light emitting diode will depend upon how much light is intercepted by the strip. The output from the two photodiodes is summed. By summing the outputs, the total is independent of lateral movement of the strip. Light emitting diodes are used so that they might be excited by a signal whose frequency is well above normal power line frequency. The higher frequency signal picked up at the photodiodes can then be either analyzed on an AC basis or rectified and analyzed on a DC basis. Additional photodiodes may be provided as reference photodiodes.

The reference photodiodes monitor changes in light emission from the light emitting diodes. Their outputs are also summed, and a difference amplifier takes the difference between the edge-sensing photodiodes and the reference photodiodes.

3,746,452

DEVICE FOR DETERMINING THE TRANSPARENCY OF THE ATMOSPHERE

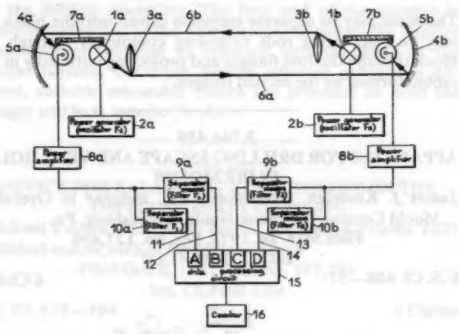
James Remy Albert Teboul, Montrouge, Hauts-de-Seine; Andre Rene Baude, Arcueil, Val de Marne, and Jean Schieving, Paris, all of France, assignors to Compagnie Des Compteurs, Montrouge, Hauts-de-Seine, France

Filed Sept. 3, 1969, Ser. No. 889,877

Claims priority, application France, Sept. 5, 1968, 68165207; Dec. 23, 1968, 68179985; Mar. 28, 1969, 6909279; Sept. 27, 1968, 68167867

Int. Cl. G01n *21/26*

U.S. Cl. 356—201 **8 Claims**



Device for determining the transparency of the atmosphere between two points comprising one light transmitter and one receiver respectively on the two points, optic fibers connecting the corresponding transmitters and receivers, means to separate the data coming through the atmosphere and through the fibers and a data processing device connected to said means.

3,746,453

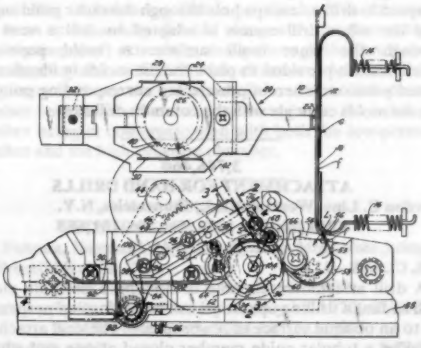
MOTION PICTURE SOUND PROJECTOR WITH AUTOMATIC FILM THREADING

Max Kotler, Montvale, N.J., and Morris Grossman, Jackson Heights, N.Y., assignors to DeJur-Amsco Corporation, Long Island City, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,460

Int. Cl. G03b *1/58*

U.S. Cl. 352—158 **5 Claims**



A motion picture sound projector system embodying automatic film threading, characterized by the provision of a motion picture film gate, a sound producing mechanism and a film guiding loop former therebetween, so relatively arranged and organized as to provide a unitary, fixed system in which the motion picture sound film is automatically fed from and through the film gate, to and through the loop former and thence to and through the parts of the sound producer, providing a completely automatic or self-threading of the motion picture film for the motion picture sound projector system.

3,746,454

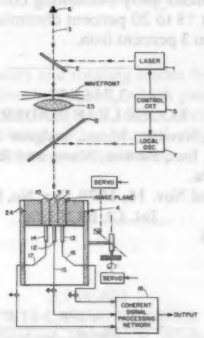
INFRARED RECEIVER FOR OPTICAL RADAR

Frank P. Pace, Dixhills; Ronald A. Lange, Huntington, and Frank R. Arams, Lake Success, all of N.Y., assignors to The United States of America as represented by the Sectetary of the Navy, Washington, D.C.

Filed Mar. 3, 1971, Ser. No. 120,564

Int. Cl. G01b *11/26*

U.S. Cl. 356—152 **6 Claims**



There is disclosed a receiver for an optical radar utilizing a two-dimensional array of microlens image dissectors which completely fills an area of an image plane. Each microlens is directly coupled to a mixer-detector element. The array is adapted to be illuminated with returned focus radiation from a remote reflecting target and with a planar wave of optical energy from a local oscillator. The output signals of the mixer-detectors are analyzed and utilized to orientate the array such that the maximum amplitude output signal corresponds to the central microlens of the array.

3,746,455

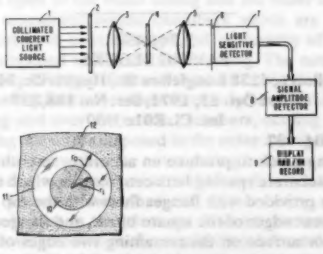
DIMENSIONAL MEASUREMENT TECHNIQUE USING OPTICAL FILTERING

Alexander L. Flamholz, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1971, Ser. No. 121,901

Int. Cl. G01b *11/24*

U.S. Cl. 356—168 **12 Claims**



A dimensional measurement technique for measuring the sizes of holes in an object under test. The object is exposed to

radiation from a coherent light source so as to transmit the radiation through the holes. An annular spatial bandpass filter removes from the transmitted radiation all frequency components outside the pass band. The intensity of the reimaged filtered radiation is then measured to determine the sizes of the holes.

3,746,456

BALL POINT PEN WRITING BALL COMPOSED OF A CEMENTED CARBIDE COMPOSITION

Franklin J. Hill, Janesville, Wis., assignor to The Parker Pen Company, Janesville, Wis.

Division of Ser. No. 851,038, Aug. 18, 1969, Pat. No. 3,628,291. This application Oct. 7, 1971, Ser. No. 187,493
Int. Cl. B43k 7/00
U.S. Cl. 401—215 6 Claims

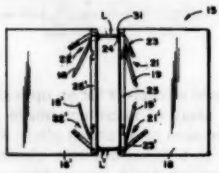
Cemented carbide compositions and shaped bodies produced therefrom containing tungsten carbide or titanium carbide and a binder alloy containing cobalt and nickel, and, by weight, about 18 to 20 percent chromium, 0.1 to 1 percent platinum and 0 to 3 percent iron.

3,746,457

LOOSE LEAF BINDERS

Elliot Comenitz, Newton, Mass., assignor to Union Bookbinding Company, Inc., Boston, Mass. and Red Rope Industries, Inc., Bristol, Pa.

Filed Nov. 16, 1970, Ser. No. 89,932
Int. Cl. B42f 3/00
U.S. Cl. 402—16 7 Claims



Two separate cover panels are mounted on two separate pliable laces to form a book structure with loose leaf pages mounted on the parallel lace portions which are between the cover panels. Each end portion of each lace lies longitudinally between and along the jaws of its own normally open, self-locking when closed and manually openable V-clamp. Two such clamps are carried on each cover panel; their fixed jaws constituting the end portions of a single slat; each such end portion having a well into which the companion movable jaw fits flush when the clamp is closed. In a modified embodiment, only one of the cover panels is provided with clamps, provision being made so that the lace ends at the other cover panel are headed to maintain their association with such clampless cover panel.

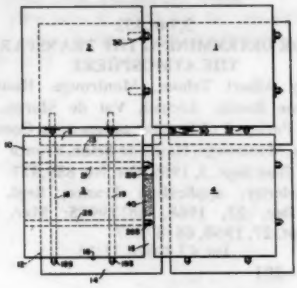
3,746,458

PAVING BLOCKS

Nick D. Allocca, 4228 Longfellow St., Hyattsville, Md.

Filed Oct. 13, 1971, Ser. No. 188,837
Int. Cl. E01c 5/00
U.S. Cl. 404—37 9 Claims

A paving block to produce an accurate, smooth upper surface and accurate spacing between joints in which the body of a block is provided with flanges flush with the top surface on two adjacent edges of the square block, and flanges flush with the bottom surface on the remaining two edges of the block, with studs projecting from the body of the block outwardly in the direction of the second flanges but being substantially shorter than the width of the flanges and lying in the rabbet for engagement with the first flanges of similar paving blocks to obtain a uniform spacing between the blocks which is filled with sand or gravel to produce a neat, uniform appearance.



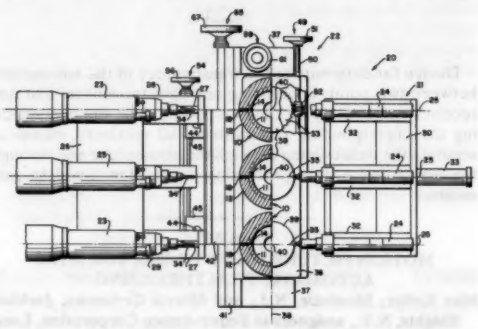
The studs may be separate elements driven into the block, or may be reinforcing rods extending completely through the block through the first flanges and projecting outwardly in the rabbet formed by the second flanges.

3,746,459

APPARATUS FOR DRILLING ESCAPE AND VENT HOLES IN DIE MOLDS

James J. Kindelan, Greensburg, Pa., assignor to Overmyer Mould Company of Pennsylvania, Greensburg, Pa.

Filed Mar. 24, 1971, Ser. No. 127,496
Int. Cl. B23b 41/00
U.S. Cl. 408—37 6 Claims



Apparatus for drilling escape and vent holes in a plurality of die molds simultaneously. The inner and outer surfaces of each die mold intersect the common drill axis of a pair of confronting, axially aligned drill means. One of the drill means is adapted to drill an escape hole through the outer mold surface and the other drill means is adapted to drill a vent hole through the inner mold surface. A mold positioning mechanism is provided to place the die molds in identical adjusted positions wherein preselected corresponding points on the die molds coincide with the common drill axes.

3,746,460

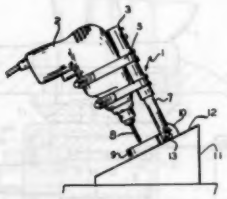
ATTACHMENT FOR HAND DRILLS

Gordon C. Lipe, West Lake Rd., Skaneateles, N.Y.

Filed June 10, 1971, Ser. No. 151,688
Int. Cl. B23b 45/14
U.S. Cl. 408—112 1 Claim

A drill attachment capable of holding a portable electric drill so that a drilling operation can be performed perpendicular to an oblique surface of a workpiece. The drill attachment includes a tubular guide member closed at one end which is releasably secured to the body of a drill in parallel relation to the drill bit. To facilitate up and down movement of the drill

and tubular member, a plunger is positioned in the tubular member and projects outwardly from the free end thereof. A biasing spring is positioned in the tubular member between its closed end and the inner end of the plunger to further enhance this up and down movement. A base member is provided to engage a portion of the oblique surface of the workpiece during the drilling operation. The free end of the plunger is pivotally connected to the base member to permit the angular adjustment of the base to coincide with the angle of the oblique surface. Once the desired adjusted position is obtained, suitable releasable means are provided to hold the plunger and base member in place.



3,746,461

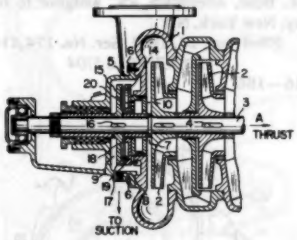
DEVICE FOR BALANCING AXIAL THRUST ON THE IMPELLER SHAFT OF PUMPS

Hidekuni Yokota, 1428 Asahi-machi, and Shingo Yokota, 1627 Midori-machi, both of Hiroshima, Japan

Filed Oct. 8, 1971, Ser. No. 187,784

Int. Cl. F04f *1/04*

U.S. Cl. 415—104 **4 Claims**



For balancing the axial thrust on the shaft of a centrifugal pump, an axially displaceable thrust drum is installed between a high-pressure chamber on the back of the impeller and a low-pressure chamber defined by an enclosure attached to the pump casing. A balancing disk is provided within the enclosure so as to be axially slidable along with the thrust drum, while a pump shaft extends centrally through the thrust drum and balancing disk with a suitable clearance. A thrust disk is firmly mounted on the pump shaft to define a balancing chamber between itself and the balancing disk, the balancing chamber being in communication with both the low-pressure chamber and the high-pressure chamber.

3,746,462

STAGE SEALS FOR A TURBINE

Seizi Fukuda, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

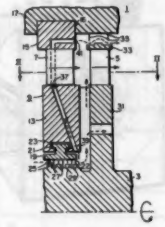
Filed June 29, 1971, Ser. No. 157,900

Claims priority, application Japan, July 11, 1970, 45/60314

Int. Cl. F04d *29/08;* **F01d** *11/02, 11/00*

U.S. Cl. 415—115 **2 Claims**

A plurality of ducts disposed in a stationary blade ring diaphragm of a steam turbine, the ducts have inlets disposed upstream of the last downstream fin of a labyrinth seal formed between the diaphragm and a rotor. The ducts extend through a plurality of stationary blades disposed in the diaphragm, and have outlets on the downstream side of the diaphragm adjacent a casing, for reducing the total quantity of steam bypassing the stationary and rotating blades forming one stage of the turbine by directing steam, which passes through the labyrinth seal adjacent the rotor, to an area upstream of a labyrinth seal associated with a shroud ring encircling the rotatable blades of this stage of the turbine.



3,746,463

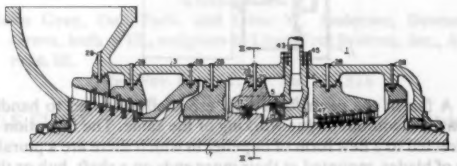
MULTI-CASING TURBINE

Alvin L. Stock, Wallingford; Herman H. Wittig, Milmont Park, and Louis Sangiorgio, Broomall, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 26, 1971, Ser. No. 166,221

Int. Cl. F01d *25/26, 25/24*

U.S. Cl. 415—136 **10 Claims**



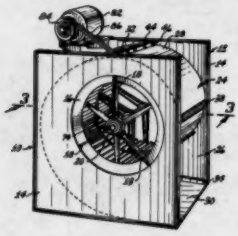
A multi-stage axial flow steam turbine having an inner and outer casing, the inner casing being a pressure vessel one end of which is open to the outer casing and the other end being closed by segmented nozzle chambers which are disposed around a rotor. A control stage and a plurality of reaction stages are disposed within the inner casing. The outer casing has a plurality of stages disposed therein so that steam leaving the inner casing flows over the outer peripheral surface of the inner casing and over the nozzle chambers, cooling them before entering the stages disposed in the outer casing. The inner casing is mounted within the outer casing in such a manner as to limit relative axial movement and allow free relative radial movement between the inner and outer casing, which is caused by changes in temperature. A steam pressure sealing device is provided between the nozzle chambers and the inner casing, the sealing device being adapted to allow free thermal expansion of the nozzle chamber with respect to the inner casing.

3,746,464

CENTRIFUGAL BLOWER ASSEMBLY

Adam D. Goettl, 4960 S. Palomino Dr., Phoenix, Ariz.

Filed Dec. 30, 1971, Ser. No. 213,992
Int. Cl. F04d *29/40*; F01d *3/00*
U.S. Cl. 415—201 7 Claims



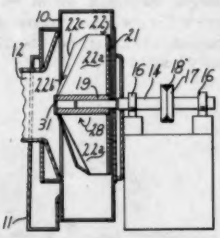
A pair of spaced apart axially slidable stub shafts upon which a rotor is supportingly mounted, and a removable segment of the spiral shaped surface of a centrifugal blower housing are provided for servicing and facilitating installation and removal of the rotor from the blower structure.

3,746,465

CENTRIFUGAL FAN FOR HANDLING MATERIAL

Donald W. Van Doorn, and William C. Pease, III, both of Columbus, Ga., assignors to Lummus ndustries, Inc., Columbus, Ohio

Filed Aug. 11, 1971, Ser. No. 170,735
Int. Cl. F04d *7/02*, *29/24*
U.S. Cl. 415—206 3 Claims



A fan of the centrifugal type especially adapted to handle material without undue working of the same. The invention is directed to a new form of impeller in which there are a plurality of blades, mounted at their inner ends on a shaft, hub or the like, the blades having generally flat sections, the blades being so disposed that when in rotation material which engages the same strikes the flat surfaces thereof and moves outwardly, that is, radially, without overworking, damaging or changing the physical characteristics of the material to any significant extent.

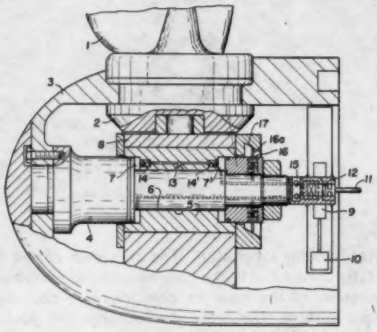
3,746,466

ADJUSTING AND LOCKING DEVICE

Gerd Dallach, Rostock-Lutten-Klein; Alfred Dudszus, Rostock; Lothar Fretwurst, Rostock-Warnemunde; Jochen Granz, and Dietrich Schlottmann, both of Rostock, all of Germany, assignors to Veb Dieselmotorenwerk, Rostock, Germany

Filed June 25, 1971, Ser. No. 156,642
Int. Cl. B63h *1/06*
U.S. Cl. 416—153 7 Claims

In combination with a propeller mounted on a shaft and having blades each mounted for rotation about a respective axis transverse to the axis of the shaft to adjust the blade pitch, a yoke mounted for displacement parallel to the axis of the shaft, means operatively connecting the yoke to the blades for converting the displacement of the yoke into rotation of the blades about the respective axes, the yoke being expansibly fitted on the shaft by an hydraulically operable expansion joint, an annular groove being formed at the joint, means forming a chamber at each axial end of the yoke, a pump,



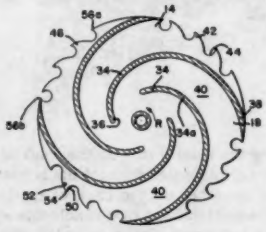
conduit means communicating between the pump and the working chambers and the annular groove, and shuttle valve means for opening communication between the pump and either one of the chambers and simultaneously closing communication between the pump and the other of the chambers the application of oil to the groove freeing the yoke for movement as oil is admitted to one or other of said chambers.

3,746,467

TOOTHED SHROUD CENTRIFUGAL IMPELLER

Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Aug. 24, 1971, Ser. No. 174,414
Int. Cl. F01d *5/04*
U.S. Cl. 416—186 18 Claims



A centrifugal impeller wherein the peripheral edges of the shrouds include alternate teeth and recesses which are located between adjacent ones of the vane outer ends to be longitudinally along the arcuate impeller vanes.

3,746,468

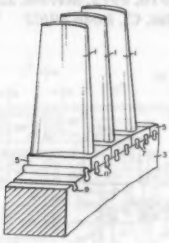
DEVICE FOR ATTACHING TURBINE BLADES TO A ROTOR

Paul D. Saunders, Mountain View, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 5, 1971, Ser. No. 186,611
Int. Cl. F01d *5/32*
U.S. Cl. 416—204 5 Claims

An annular array of circumferentially spaced rotatable turbine blades is securely fastened to a rotor by a plurality of pins having an hourglass shaped cross section; the pins fit into a

plurality of axially disposed, registering grooves in the blades and rotor and provide multiple blade roots and reduce the



probability of a blade flying off the rotor as fatigue cracks must initiate and propagate through a plurality of the roots to have such a failure.

3,746,469

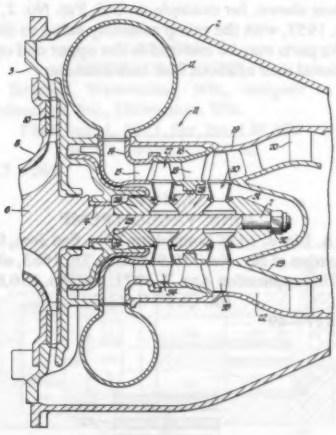
TURBOMACHINE ROTOR

George W. Mason, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 3, 1971, Ser. No. 120,485

Int. Cl. F01d *5/30*

U.S. Cl. 416—213 **3 Claims**



A rotor stage of an axial-flow turbine includes a bladed wheel made up of circumferentially abutting radially extending elements, each of which has a blade at its outer end and a sector of the wheel hub at its inner end. The wheel hub sectors are mounted between abutments on a shaft, which may be undercut to provide a dovetail connection between the hub sectors and the abutments to hold the wheel together. The wheel sectors may be united by brazing or welding, in which case the abutments are not necessarily undercut. An interlock may be provided between adjacent wheel elements by a dovetail connection between the flanks of the elements or by separate keys engaging in slots in the flanks of the elements. The wheel portion of the rotor stage is made impervious to leakage of fluid through it by webs extending from the wheel elements into contact with each other or by annular disks covering the radially central portion of the wheel elements.

3,746,470

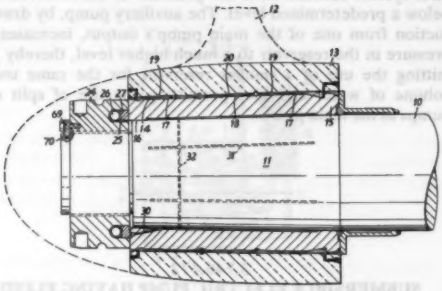
MOUNTING OF PROPELLERS ON SHAFTS

Thomas Walter Bunyan, London S.E. 10, England, assignor to Pilgrim, P & O Valve Limited, London, England

Continuation-in-part of Ser. No. 802,904, Feb. 27, 1969, Pat. No. 3,577,628. This application Apr. 5, 1971, Ser. No. 131,072

Int. Cl. B23k *31/02*

U.S. Cl. 416—244 **14 Claims**



A method of mounting a propeller on a tapered portion of a shaft in torque and thrust transmitting connection therewith. The propeller is supported in a horizontal position and an internally tapered metallic sleeve is lowered into a bore in passing axially through the centre of the hub of the propeller. The outside diameter of the sleeve is less than the inside diameter of the bore so that there is an annular space between the bore and the sleeve. O ring seals are placed between the bore and the sleeve at each end of the sleeve to close the annular space and junk rings are placed over the O ring seals to locate the sleeve centrally in the bore. A cold setting composition is pumped into the annular space and held under pressure until it has set. The sleeve is then force-fitted onto the tapered portion of the shaft.

3,746,471

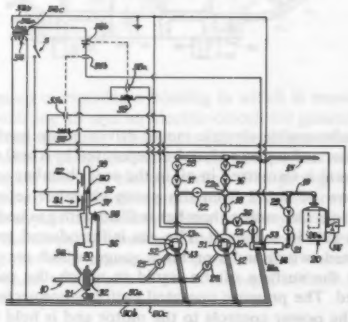
WATER PRESSURE BOOSTER SYSTEM USING AUXILIARY PUMP TO SUPER CHARGE PRESSURIZED RESERVOIR

John Gray, Oak Park, and Gene W. Anderson, Downers Grove, both of Ill., assignors to Liqui-Trol Systems, Inc., Aurora, Ill.

Filed Nov. 8, 1971, Ser. No. 196,575

Int. Cl. F04b *41/02, 41/06*

U.S. Cl. 417—7 **9 Claims**



A water pressure booster system includes a plurality of main pumps which are sequenced according to system demands to maintain the pressure in a discharge conduit at a constant level for all flow rates. An auxiliary pump having a small

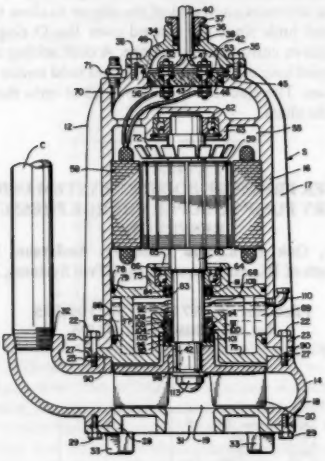
capacity but capable of developing a high pressure head at low flow rates is connected to the output of one of the main pumps to feed a pressurized reservoir. Control circuitry sensing both the flow rate in the input conduit and the gas pressure in the pressurized reservoir de-energizes all pumps only when the flow is below a predetermined minimum level and the gas pressure within the pressurized reservoir is above a predetermined level sufficient to maintain the desired discharge or system pressure. When all pumps are off, the reservoir supplies system demand until the pressure in the reservoir falls below a predetermined level. The auxiliary pump, by drawing suction from one of the main pump's output, increases the pressure in the reservoir to a much higher level, thereby permitting the use of a smaller reservoir for the same usable volume of water and also permitting the use of split case pumps as the main pumps.

3,746,472

SUBMERSIBLE ELECTRIC PUMP HAVING FLUID PRESSURE PROTECTIVE MEANS

Warren E. Rupp, Mansfield, Ohio, assignor to The Warren Rupp Company, Mansfield, Ohio

Filed Aug. 6, 1971, Ser. No. 169,723
Int. Cl. F04b *49/10*; F01d *11/00*; F04d *29/08*
U.S. Cl. 417—9 **7 Claims**



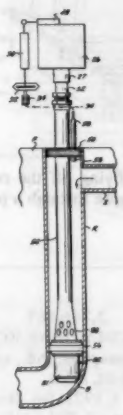
A submersible electric motor driven pump having a motor chamber and a pump chamber separated by a seal chamber. A shaft seal is immersed in oil in the seal chamber and prevents the flow of liquid from the pump chamber into the motor chamber. The motor chamber is filled with gas under pressure which aids in sealing it. The gas is introduced to a pressure operated switch and a pressure gauge, which may be located above the surface of the liquid in which the pump is submerged. The pressure operated switch is connected in circuit with the power controls to the motor and is held closed by a predetermined minimum pressure of gas in the motor chamber. In case of a pressure loss from a shaft seal failure the switch is automatically opened and power to the motor is interrupted thus preventing pumped liquid from entering the motor chamber while the motor is energized.

3,746,473

FLOOD CONTROL VALVE AND PUMP ASSEMBLY

Warren H. DeLancey, Elyria, Ohio, and Donald Weisman, Southfield, Mich., assignors to Flood Control Valve Company, Detroit, Mich.

Filed Mar. 10, 1972, Ser. No. 233,475
Int. Cl. F04b *49/02*
U.S. Cl. 417—38 **1 Claim**



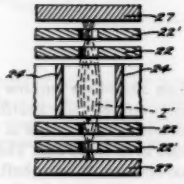
A pump assembly adapted to be installed as a complete assembly in a conventional or about four inch pipe riser as part of a system shown, for example, in U.S. Pat. No. 2,725,112 of Nov. 29, 1955, with the pump assembly being so dimensioned that all its parts may be inserted in the upper end opening of a conventional riser of about four inch diameter.

3,746,474

IONIC VACUUM PUMP

William A. Lloyd, 1422 Longfellow Way, San Jose, Calif.

Continuation of Ser. No. 330,960, Dec. 16, 1963, abandoned. This application Apr. 2, 1971, Ser. No. 130,815
Int. Cl. F04b *37/00*
U.S. Cl. 417—49 **5 Claims**



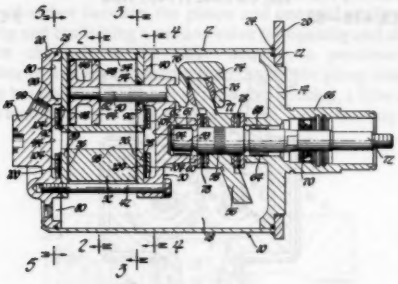
A glow discharge pumping device is disclosed having an anode, a sputter cathode, and additional electrode means for controlling the glow discharge. In one embodiment the additional electrode means are two apertured planar electrides positioned between the anode and the cathode. In another embodiment the cathode comprises a rod inside the anode, and the additional electrode means is a grid surrounding the cathode rod in the anode.

3,746,475

DOUBLE-ACTING SWASHPLATE COMPRESSOR

Ralph S. Johnson, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1971, Ser. No. 112,335
Int. Cl. F04b 1/12
U.S. Cl. 417—269 1 Claim



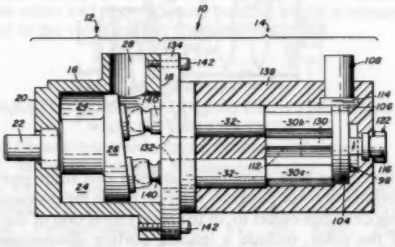
In preferred form, a fluid compressor for an automobile air conditioning system having three cylinders within a cylinder block which is supported within a compressor casing by one end of the casing. Pistons are reciprocated within the cylinders by piston rods which extend through a cylinder head into the interior of the casing. A drive shaft extending through the other end of the casing rotates an inclined swashplate which coacts with the piston rods to reciprocate the pistons. A high pressure discharge passage is centrally formed on both ends of the cylinder block and are interconnected by a passage axially extending therebetween. A low pressure intake passage is formed on the cylinder ends and encircles the discharge passage.

3,746,476

HYDRAULIC PUMP

Arthur S. Bradley, Wauwatosa, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Apr. 1, 1971, Ser. No. 130,372
Int. Cl. F04b 1/12, 27/08
U.S. Cl. 417—269 9 Claims



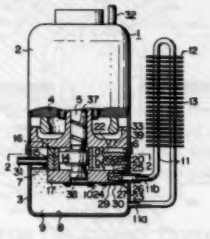
A hydraulic pump of the axial, parallel piston type comprising a housing divided into first and second sections with the first section defining a chamber. A rotatable shaft extends centrally and axially of said chamber through one end of said housing and has a cam plate keyed thereto for rotation with the shaft. The second section, or piston carrier section is comprised of a moldable plastic material having a plurality of modular units embedded therein. Each of the modular units includes a cylinder for slidably receiving a piston, an output check valve unit integrally attached to said cylinder, and a bypass check valve unit integrally attached to and offset from said output check valve unit. An output manifold and a bypass control manifold are connected to the output check valve unit and the bypass check valve unit respectively of each modular unit.

3,746,477

ROTARY COMPRESSOR

Masao Ozu, and Shinsaku Mori, both of Fuji, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Apr. 27, 1971, Ser. No. 137,851
Claims priority, application Japan, May 1, 1970, 45/42339; May 30, 1970, 45/52948
Int. Cl. F04b 39/02, 39/06
U.S. Cl. 417—372 8 Claims



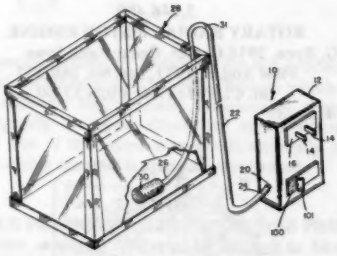
A rotary compressor comprising a lubricant reservoir placed in the lower part of a compressor body; and a lubricant circulating mechanism for cooling lubricant received in said reservoir by conducting it through a tubing provided with a heat exchanger and supplying the lubricant thus cooled to the compressing unit of said body and those sections of said body through which there slides a blade.

3,746,478

WALL-MOUNT AIR PUMP

Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, East Paterson, N.J.

Filed June 25, 1971, Ser. No. 156,861
Int. Cl. F04b 45/04; F16l 15/04
U.S. Cl. 417—413 2 Claims



An air pump comprising a housing in which is mounted a pump for emitting air and an electric-circuit for generating a magnetic field, the latter which actuates the pump. A pair of electric-terminal prongs extend from the housing and are electrically coupled with the electric-circuit. The prongs may be directly inserted into a wall-mounted electric power receptacle and, thereby, in the absence of any auxiliary members, act to support the air pump housing. Tubing is provided for communicating the wall-mounted air pump with a water-filled aquarium, which tubing acts to direct air expelled from the air pump into the aquarium.

ERRATUM

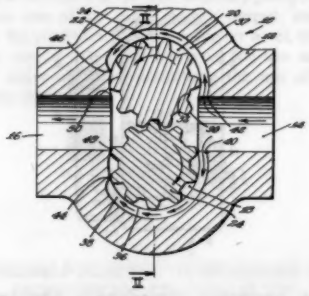
For Class 417—571 see:
Patent No. 3,746,483

3,746,479

HYDRAULIC MOTOR WITH MINIMUM BREAK-AWAY TORQUE

Phillip B. Spencer, Royal Oak, and John A. Hovanchak, Detroit, both of Mich., assignors to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 887,212, Dec. 22, 1969, abandoned.
This application Oct. 14, 1971, Ser. No. 189,399
Int. Cl. F01c *1/18*; F03c *3/00*
U.S. Cl. 418—15 8 Claims



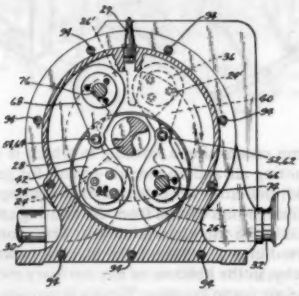
A hydraulic motor device particularly characterized as exhibiting minimum break-away torque under starting or accelerating conditions. The device comprises a housing having an inlet, an outlet at opposite sides. The device also contains a pair of rotary gears in said housing having shaft means disposed on axes of rotation concentric to the bore walls, each rotary gear having alternating gear teeth and gear tooth spaces and being in full meshing engagement with one another. Also present are means to pump fluid under pressure through said inlet and against said teeth whereby said gears are rotated, and at least one arcuate circumferential groove in each bore wall connected to the inlet, and communicating with the teeth of said gears, but having a width less than the width of said teeth. The presence of fluid in the groove reduces startup and running friction at the tips of the gear teeth.

3,746,480

ROTARY RADIAL PISTON ENGINE

Ronald G. Ryen, 2910 Center, Cedar Falls, Iowa

Filed Aug. 5, 1971, Ser. No. 169,237
Int. Cl. F01c *1/00*; F02b *53/00*
U.S. Cl. 418—37 6 Claims



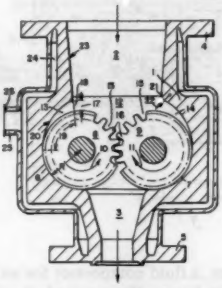
A pair of radial pistons coaxially journaled within a cylindrical housing are connected to an output shaft through a series of linkages which include end drive plates connected to the output shaft. The linkages function as toggles such that as the pistons rotate they accelerate and decelerate individually thereby creating a volume between them which is constantly changing.

3,746,481

GEAR PUMP FOR VISCOUS THERMOPLASTIC MELTS

Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Aug. 6, 1970, Ser. No. 61,643
Claims priority, application Germany, Aug. 16, 1969, P 19 41 673.0
Int. Cl. F04c *1/14, 29/04*
U.S. Cl. 418—83 5 Claims



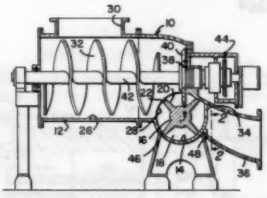
A gear pump having two rotatable intermeshed gears mounted in a hollow cavity of the pump casing for transporting and discharging a viscous thermoplastic melt, the hollow cavity being enlarged at the inlet side of the pump casing to provide an elongated arcuate wedge-shaped filling chamber extending from the inlet outwardly around each gear to converge onto the gear periphery in the circumferential direction of the transported melt.

3,746,482

PUMP HAVING DISCHARGE BAFFLE MEANS

Oscar Luthi, Nashua, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Filed Oct. 6, 1971, Ser. No. 186,864
Int. Cl. F01c *1/24*; F04c *1/14, 17/16*
U.S. Cl. 418—201 16 Claims



Pumps of the type comprising at least one rotor provided with peripheral rotor pockets, wherein baffle means cause the pumping chamber outlet to, in the rotary direction of the rotation of the rotor, include a leading portion dimensioned to open to only a part of the length of each rotor pocket followed by a trailing portion dimensioned to open to a longer length of each rotor pocket.

3,746,483

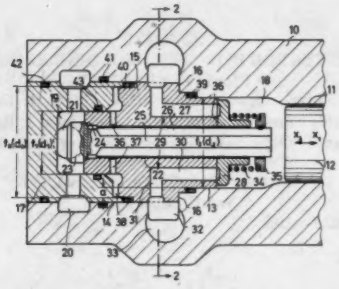
RECIPROCATING PISTON PUMP

Hans Hindel, and Hugo Fries, both of Urach, Germany, assignors to Pumpenfabrik Urach, Wurttemberg, Germany

Filed Mar. 31, 1972, Ser. No. 240,256
Claims priority, application Germany, Apr. 13, 1971, P 21 17 841.6
Int. Cl. F04b *39/10*; F16k *15/00*
U.S. Cl. 417—571 14 Claims

A reciprocating piston pump having a pump housing with an axial bore of two different diameters separated by an annular

shoulder and a cylinder at the end of the narrower part of the bore in which a piston is movable, and a valve housing inserted into the bore and having an annular shoulder which is formed between an enlarged part and narrower part of the valve housing and is pressed against the shoulder of the pump housing. For preventing varying stresses from being exerted especially upon this shoulder area of the valve housing and for making the latter of a very compact size, the invention provides the pump chamber between the piston and one end of the valve housing and containing a suction valve for opening and closing suction channels in the valve housing, a pressure-valve chamber of a smaller diameter than that of the pump chamber axially beyond the other end of the valve housing, a flow channel extending longitudinally through the valve housing from



the pump chamber to the pressure-valve chamber and terminating at this other end in a valve seat for the pressure valve the valve stem of which extends through the flow channel, and a compensating chamber which communicates through transverse channels with the flow channel and is formed between the other end of the enlarged part of the valve housing and the rim part of a cup-shaped plug which is inserted into and closes the open end of the wider part of the bore in the pump housing, while the bottom wall and the adjacent inner wall parts of the plug together with the end wall of the narrowest part of the valve housing define the pressure-valve chamber. Both valves are adapted to be closed at the respective strokes of the piston by a single spring one end of which acts upon the suction valve and the other end upon a spring bearing which is mounted on the end of the valve shaft in the pump chamber.

3,746,484

APPARATUS FOR DEVELOPING HIGH PRESSURE AND HIGH TEMPERATURE

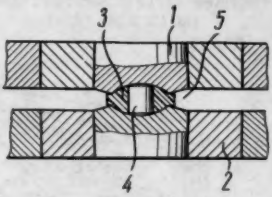
Leonid Fedorovich Vereschagin, Kutuzovsky prospekt, 2, kv. 231, Moscow; Valentin Nikolaevich Bakul, ulitsa Kirova, 34a, kv. 12., Kiev; Aik Akopovich Semerchan, Kutuzovsky propsekt, 12, kv. 205, Moscow; Alexei Iosifovich Prikhna, ulitsa Vyshgorodskaya, 33, kv. 20, Kiev; Vladimir Vasilievich Popov, ulitsa Chernyshevskogo, 31, kv. 12, Moscow; Jury Nikolaevich Ryabinin, Vorobievskoe shosse, 2, kv. 40, Moscow; Leopold Davydovich Livshits, Gogolevsky bulvar, 23, kv. 25, Moscow; Robert Georgievich Arkhipov, ulitsa Udaltsova, 4, kv. 291, Moscow; Vladislav Nikolaevich Slesarev, ulitsa Televidenia, 2/6, korpus 2, kv. 41, Moscow; Vasily Andreevich Galaktionov, 3 Akademichesky proezd, 11, kv. 10, Moscow, and Boris Pavlovich Demyashkevich, Leningradsky prospekt, 57, kv. 153, Moscow, all of U.S.S.R.

Filed Oct. 7, 1971, Ser. No. 187,269

Int. Cl. B30b 11/32

U.S. Cl. 425—77 **2 Claims**

An apparatus for developing high temperature and high pressure has a pair of identical dies having opposing cooperating end faces, each face end having therein a spherical cavity and a conically tapering peripheral portion. When the end faces of the two dies are brought closer together, the two spherical cavities conjointly form therebetween a high pressure chamber in which there is received a container made of a plastic material, and the respective peripheral tapering portions form therebetween a gap. The ratio of the radius of curvature of the cavity in each end face to the diameter of this cavity does not exceed 0.75. The volume of the container and its contents is substantially equal to the total volume of the high pressure chamber and the peripheral gap.



3,746,485

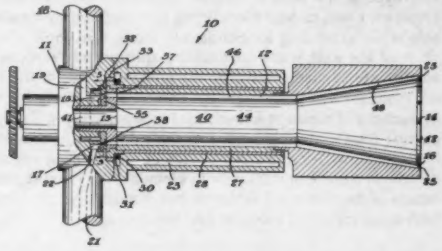
APPARATUS FOR THE PRODUCTION OF NET-LIKE STRUCTURES

Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 856,513, July 16, 1969, Pat. No. 3,609,509, which is a division of Ser. No. 505,674, Oct. 29, 1965, Pat. No. 3,498,873. This application Apr. 22, 1971, Ser. No. 136,372

Int. Cl. B29f 1/12

U.S. Cl. 425—131 **5 Claims**



This invention relates to apparatus for the production of thermoplastic net comprising bonded filaments which have at least two different thermoplastic components disposed in generally spirally arranged alternating layers wherein the material of one of the layers is mono-directionally oriented and the remaining material is generally unoriented.

3,746,486

APPARATUS FOR CONTROLLING POLYMER PRESSURE

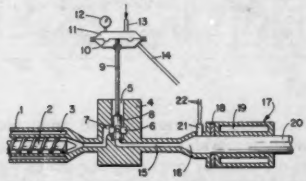
Olav E. Koster, Arnhem, Netherlands, assignor to Akzona Incorporated, Ashville, N.C.

Filed Nov. 13, 1970, Ser. No. 89,338

Claims priority, application Netherlands, Nov. 29, 1969, 6917982

Int. Cl. B29f 3/06

U.S. Cl. 425—146 **3 Claims**



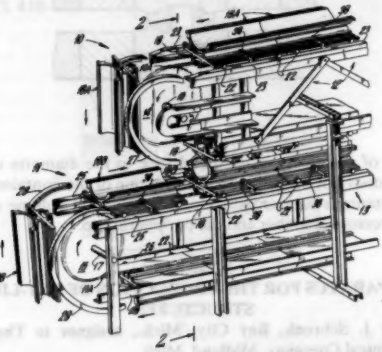
Means for controlling polymer pressure in a molding device by varying pressures in a stepping mode to both sides of the diaphragm-operated control valve.

3,746,487

CONVEYOR-MOLD CONSTRUCTION

Theodore E. Andrews, Kutztown, Pa., assignor to Armstrong Cork Company, Fogelsville, Pa.

Filed Aug. 23, 1971, Ser. No. 174,008
Int. Cl. B28b 17/00
U.S. Cl. 425—184 14 Claims



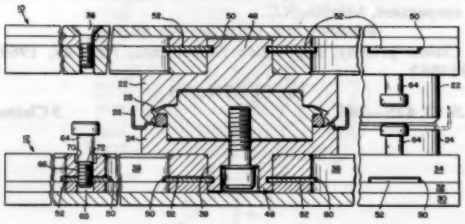
A conveyor-mold construction is provided for continuously producing lengths of foam plastic material comprising endless upper and lower conveyors having mold elements coupled thereon via a base plate such that the mold elements of the upper conveyor mate with the mold elements of the lower conveyor at the path of nearest approach. Each of the mold elements has a concaved molding face defined by contiguous side walls extending longitudinally along said mold element, each of the side walls terminating transversely into an edge which defines diametrally the dimensional limits of the resulting mold formed from the mold halves. The remote back face of each mold element has means for registering with the supporting base plate, each edge of the side walls of the element having means for registering with corresponding registering means on a corresponding mold element, the mold registering means of the two mold elements being mutually interlockable, such as by means of a tongue and groove register.

3,746,488

APPARATUS FOR REMOVABLY HOLDING MOLD CAVITY SECTIONS TO MOLD PLATES

Edward J. Messenger, Gastonia, N.C., assignor to Garlock, Inc., Palmyra, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,425
Int. Cl. B29c 3/00
U.S. Cl. 425—195 3 Claims



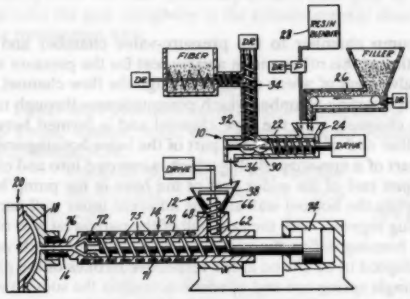
Tools, such as compression mold cavity sections, are easily and quickly removably mounted on plates, such as compression mold plates, by providing the plates with a plurality of openings therein, adapted to receive a mating extension of the tool. The plate also has a plurality of slots perpendicular to and intersecting the openings, for receiving a key or slide bar retainer. The tool extensions have a keyway or groove mating with the slot for removably receiving the slide bar. The edges of the slide bars have notches or recesses corresponding in shape to the shape of the openings, whereby the slide bars can be moved a short distance from a tool-locking position to a tool-releasing position where the recesses register with or correspond to the openings to release the tools, without the need for withdrawing the slide bar entirely out from the plate. A plurality of different types of mold cavity sections can be held to the same mold plates in this way and different tools can be interchangeably connected to the same retainer plate as long as the tools each include a properly grooved extension adapted to extend into the plate opening and to matingly receive the slide bar.

3,746,489

APPARATUS FOR INJECTING MOLDING REINFORCED PLASTIC ARTICLES

Marc A. Rizzi, Orange; Peter Hold, Milford; Dominic A. D'Amato, Cheshire, all of Conn., and Dario J. Ramazzotti, Tallmadge, Ohio, assignors to USM Corporation, Boston, Mass.

Filed Dec. 28, 1970, Ser. No. 101,791
Int. Cl. B29f 3/02
U.S. Cl. 425—205 1 Claim



A method and apparatus in which dry materials including reinforcing fibers and liquid thermosetting type resin materials are mixed, forming a viscous dough-like mixture which is fed continuously for direct transfer to an injection device having a nozzle through which the mixture is injected into the cavity of a mold for reaction of the mixture to form reinforced plastic articles.

3,746,490

PASTE COMPOSITIONS FOR CONTROLLING FIRST INSTAR BOT LARVAE AND ENDOPARASITES IN HORSES

William P. Marsland, Turlock, Calif., and Marvin L. Sharp, Vernon, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1971, Ser. No. 211,709
Int. Cl. A61k 27/00
U.S. Cl. 424—219 4 Claims

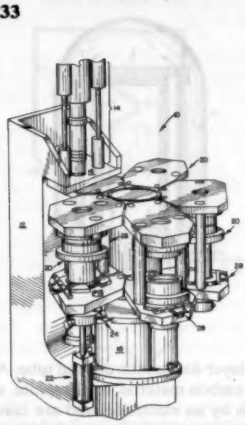
A method for controlling first instar bot larvae and endoparasites in horses which comprises applying into the mouth of the horse a paste composition containing dimethyl dichlorovinyl phosphate which adheres to the mouth and hard palate of the horse.

3,746,491

INJECTION MOLDING APPARATUS

Richard H. Daly, Wood Dale; Robert V. Brink, Carpentersville, and Kare Andersen, Elgin, all of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Jan. 7, 1972, Ser. No. 216,094
Int. Cl. B28b 5/08
U.S. Cl. 425—233 14 Claims



An apparatus for molding articles from rubber or like moldable material. The apparatus preferably includes a plurality of molding stations disposed about the periphery of a turntable or the like. Each molding station includes a frame assembly having means thereon for receiving pairs of separable mold parts supported on the receiving means and movable along a given axis to a closed position of the mold parts. The receiving means also includes a pair of relatively movable elements normally urged apart by a spring, and a lock is provided for cooperation with one of the elements and a portion of the station frame so that one of the elements may be urged into a locked positioned, and whereby the force may be exerted through the spring onto one mold part to maintain the mold in a closed position. The entire molding station is movable as a unit into a position of registry with a clamping assembly which is capable of applying a much higher force thereto during injection of the moldable material. The individual stations are mounted for free but limited movement within the clamping assembly to relieve the turntable of clamping stresses and the individual stations are likewise readily removable for replacement or for processing of mold parts.

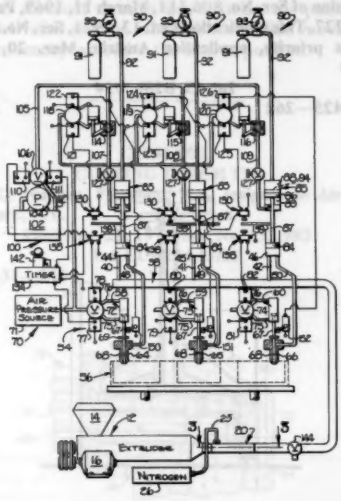
3,746,492

APPARATUS FOR MOLDING FOAMED THERMOPLASTIC ARTICLES

William R. DeVita, Matthews, N.C., assignor to Structural Foam Products, Inc., Pineville, N.C.

Filed June 14, 1971, Ser. No. 152,612
Int. Cl. B28b 1/00
U.S. Cl. 425—244 12 Claims

An apparatus for molding foamed thermoplastic articles and including an extruder for melting a thermoplastic material and conveying it along a path of travel, a mixer positioned in the path of travel for receiving the melted material and mixing a gaseous blowing agent therewith, a plurality of expandable accumulation chambers communicating with the path of travel for receiving the mixture from the mixer, a mold for receiving the mixture from the accumulation chambers, and means for establishing communication between each of the accumulation chambers and the mold. The expandable accumulation chambers each include a translatable piston, and pressure means for applying a first force on each piston to maintain a pressure in the chambers sufficient to preclude premature foaming of the mixture. In order to rapidly force the mixture from each of the accumulation chambers into the mold, the pressure means is adapted to selectively apply a second force of greater intensity than the first force on each of the pistons substantially concurrently with communication



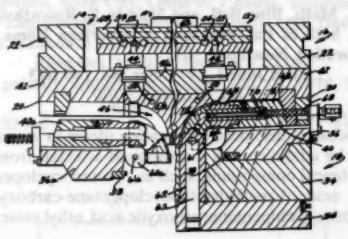
being established between the accumulation chambers and the mold. Means are provided for independently adjusting the upper limit of translation for each piston whereby the volume of the accumulation chambers may be varied.

3,746,493

APPARATUS FOR MOLDING ELBOWS AND THE LIKE

John D. Stalter, Elkhart, Ind., assignor to Nibco, Inc., Elkhart, Ind.

Division of Ser. No. 757,536, Sept. 5, 1968, Pat. No. 3,632,277. This application Apr. 13, 1971, Ser. No. 133,589
Int. Cl. B29d 23/02; B29f 1/00; B29c 1/00
U.S. Cl. 425—250 4 Claims



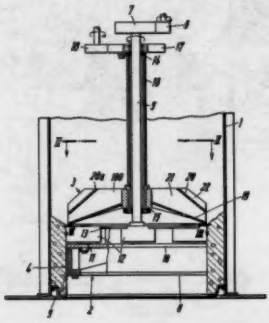
An injection-molding apparatus including a mold structure having a plurality of spaced, adjacent internal mold cavities, with the mold structure formed of a pair of relatively movable members, each of which have concavities comprising half of each such molding cavity, wherein the molding cavities have a curving shape designed for the molding of curved objects, wherein the mold structure members form parting lines along each side of such object which lie in planes spaced from and parallel to the plane in which the longitudinal axis of the molded object lies, and wherein one mold structure member is moved relative to the other when the two members are parted in a manner which wipes the molded objects off a central core structure used to produce tubular objects.

3,746,494

APPARATUS FOR MAKING CONCRETE TUBES

Friedhelm Gauger, Ettlingenweier, Germany, assignor to Maschinenfabrik Ettlingen, Friedrich Pfeiffer KG, Ettlingen, Germany

Division of Ser. No. 806,111, March 11, 1969, Pat. No. 3,649,727. This application Oct. 13, 1971, Ser. No. 188,823
Claims priority, application Austria, Mar. 20, 1968, A 2781/68
Int. Cl. B28b *1/34*
U.S. Cl. 425—262 10 Claims



An apparatus for producing concrete tubes using a vertical tubular mold with a rotating piston-like pressing device moving upwards axially inside the mold. The piston-like pressing device is operated in such a manner that as the torque required for rotation of the piston-like pressing device decreases owing to a decrease in the supply of concrete, the rate of upward travel of the piston is decreased. An impeller is located above the pressing device which can be rotated at a higher speed and in opposed sense with regard to the rotational speed and sense of rotation of the piston-like pressing device.

3,746,495

ANTI-ULCER THERAPY

Jerry L. Malis, Blue Bell, and Marvin E. Rosenthale, Havertown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed June 1, 1971, Ser. No. 149,063
Int. Cl. A61k *27/00*
U.S. Cl. 429—319 1 Claim

A process as disclosed for treating ulcers in warm-blooded animals by administering a compound selected from a group of cycloleucyl compounds, such as, 1-aminocyclopentanecarboxylic acid, 1-methylaminocyclopentane-carboxylic acid, and 1-aminocyclopentanecarboxylic acid, ethyl ester.

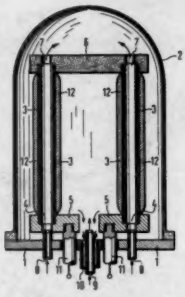
3,746,496

DEVICE FOR PRODUCING TUBULAR BODIES OF SEMICONDUCTOR MATERIAL, PREFERABLY SILICON OR GERMANIUM

Wolfgang Dietze, Munich; Konrad Reuschel, and Herbert Sandmann, both of Vaterstetten, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 8, 1971, Ser. No. 113,286
Claims priority, application Germany, Oct. 12, 1970, P 20 50 076.9
Int. Cl. C23c *13/08*; B29c *13/00*
U.S. Cl. 425—447 10 Claims

A device for producing tubular bodies of semiconductor material, preferably of silicon or germanium. To this end, a rod or tube shaped carrier is heated in a reaction gas for precipitating the respective semiconductor, as a result of which the jacket area of the carrier is coated with a layer of the semiconductor. Following the removal of the carrier, this



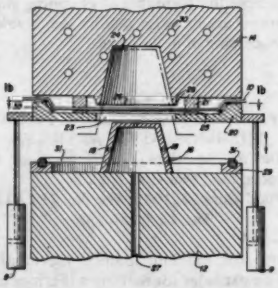
semiconductor layer defines the desired tube. At least two vertical carriers of carbon material, e.g. graphite, are each held at their lower ends by an electrode, and are connected at their upper ends by a conductive bridge, preferably of carbon.

3,746,497

APPARATUS FOR MAKING ARTICLES OF MANUFACTURE FROM A THIN FILM OF PLASTIC

Peter C. Neil, Fullerton, Calif., assignor to Standard Oil Company, Chicago, Ill.

Filed Apr. 8, 1971, Ser. No. 132,376
Int. Cl. B29f *5/00*
U.S. Cl. 425—398 1 Claim



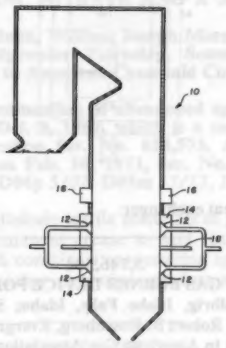
Disclosed is an improved thermoforming process wherein the amount of plastic film forced into a mold cavity is restricted so that only the proper amount required is introduced into the cavity. The restricting step may be achieved by (1) clamping the film at the open mouth of the cavity and then forcing film into the cavity or (2) heating only those portions of the film which are needed to properly fill the cavity or (3) heating the film uniformly and then selectively cooling those portions of the film which should not be introduced into the cavity. Novel clamping apparatus is also disclosed.

3,746,498

REDUCING NO EMISSIONS BY ADDITIVE INJECTION

Mathew Paul Stengel, Bristol, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 24, 1972, Ser. No. 220,161
Int. Cl. F23j 7/00
U.S. Cl. 431—4 6 Claims



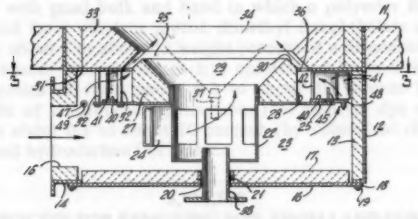
The nitrogen oxides formed during combustion processes are reduced by injecting materials into a fuel-rich combustion zone. These additives decompose to produce reducing agents such as hydrogen and carbon monoxide which in turn react with the nitrogen oxides to produce nitrogen. The additives may comprise formates and oxalates such as sodium formate and sodium oxalate. The carbonates which are formed are also useful to reduce sulfur oxide pollution.

3,746,499

STAGED AIR BURNER WITH SWIRLING AUXILIARY AIR FLOW

Robert P. Guerre, Dover, and Ross R. Ruland, Hopatcong, both of N.J., assignors to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 52,341, July 6, 1970, Pat. No. 3,671,173. This application Jan. 12, 1972, Ser. No. 217,349
Int. Cl. F23m 9/08
U.S. Cl. 431—182 16 Claims



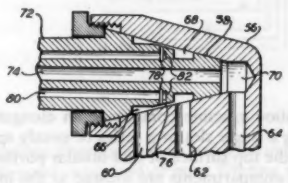
A chamberless, high intensity staged air burner especially suited for the incineration and combustion of contaminated fuels and waste streams by achieving a high, concentrated degree of mixing and, therefore, a high temperature, in a relatively small but structurally unconfined volume. The burner utilizes the principle of vortex air flow from an air induction chamber together with swirling auxiliary air flow to achieve a high degree of recirculation local to the point of fuel injection, to provide intimate mixing of fuel and air, precise control over the flame envelope. Utilizing the air required for combustion in the foregoing manner eliminates the need for a refractory-lined chamber which otherwise would be required to confine the combustion process in order to generate the extreme temperatures sometimes required for complete incineration. The swirling auxiliary air flow is obtained by providing a plurality of circumferentially arranged swirl vanes in way of the portion of inlet air directed through the auxiliary air passageways. These swirl vanes may be mounted for limited movement or can be stationarily secured in the desired position.

3,746,500

CUTTING TORCH TIP

Howard G. Hughey, Fanwood, N.J., assignor to Airco, Inc., New York, N.Y.

Filed Apr. 21, 1971, Ser. No. 135,952
Int. Cl. F23d 13/32
U.S. Cl. 431—346 3 Claims



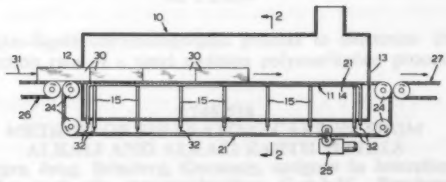
This invention relates to pre-mix gas fuel cutting torches wherein an annular groove is provided which intersects each of a plurality of pre-mix gas passages whereby a tortuous path is formed having a severe restriction which interrupts and quenches return combustion and thereby creates a high resistance to torch flashbacks or backfires.

3,746,501

CONTINUOUS PASSAGE OF METAL SLABS THROUGH HEATING FURNACE

Karl Sanderson, King City, Ontario, Canada, assignor to Lee Wilson Engineering Company of Canada Ltd., Downsview, Ontario, Canada, a part interest

Filed Oct. 1, 1970, Ser. No. 77,118
Claims priority, application Canada, Jan. 12, 1970, 71862
Int. Cl. F27b 9/24
U.S. Cl. 432—6 14 Claims



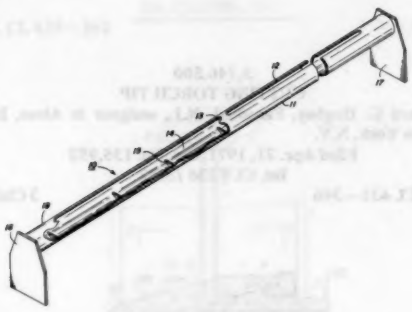
A method and apparatus for continuously passing metal slabs through a heating furnace, in which the slabs are pushed in abutting relationship and are supported on at least one chain which slides under the action of the slabs along a trough extending through the furnace. The trough is preferably recessed longitudinally in a cooling pipe.

3,746,502

EVAPORATION CRUCIBLE

Francis J. Erhart, Webster, and Carl B. Fisher, Mendon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1971, Ser. No. 209,608
Int. Cl. F27b *21/04*
U.S. Cl. 432—263 **5 Claims**



An evaporation crucible comprising an elongated tubular portion having a single slot or a series of evenly spaced elongated slots at the top surface of said tubular portion. A series of continuous compartments are located at the internal bottom surface of the tubular portion with a series of plates evenly dividing said compartments.

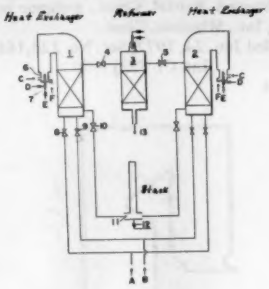
3,746,503

METHOD AND APPARATUS FOR HEATING COMBUSTIBLE GAS

Tsuneo Miyashita, and Tsutomu Fukushima, both of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 16, 1971, Ser. No. 208,674
Claims priority, application Japan, Dec. 22, 1970, 45/115371
Int. Cl. F23l *9/04*
U.S. Cl. 432—30 **11 Claims**

This invention relates to a regenerator heat exchanger with means for changing over a reforming stage to a reheating stage and vice versa. The invention is also concerned with a method



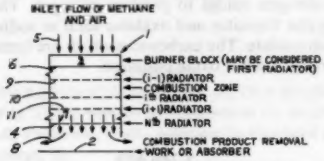
of using such heat exchanger.

3,746,504

RADIANT GAS BURNER DEVICE FOR HEATING

Charles W. Solbrig, Idaho Falls, Idaho; Sanford A. Weil, Chicago, and Robert B. Rosenberg, Evergreen Park, both of Ill., assignors to American Gas Association, Inc., Arlington, Va.

Filed Oct. 19, 1970, Ser. No. 82,109
Int. Cl. F26b *3/28*
U.S. Cl. 432— 31 **15 Claims**



A high efficiency radiant heating device for heating radiant heat absorbers, and method of constructing high efficiency radiant heating devices. The device has an element which upon heating emits radiant energy. The radiation emitting element is selected to have high emissivity at wavelengths closely corresponding to those determined to be absorbable by the absorber.

CHEMICAL

3,746,505

TREATMENT OF CELLULOSIC TEXTILES WITH 1,3-DIMETHYLOL-4,5-DIHYDROXY-2-IMIDAZOLIDINONE, ZINC NITRATE AND A SEQUESTERING AGENT

Robert Francis Bann, William Joseph Moran, and Philip B. Roth, Bridgewater Township, Somerset County, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation of abandoned application Ser. No. 672,450, Oct. 3, 1967, which is a continuation-in-part of application Ser. No. 628,573, Apr. 5, 1967. This application Feb. 10, 1971, Ser. No. 114,380

Int. Cl. D06p *5/02;* D06m *13/12, 13/34*

U.S. Cl. 8—74 4 Claims

A finish for cellulosic textile materials to give a wrinkle resistant and permanent crease to said textile materials, wherein the finish contains a sequestering agent making it compatible with other operations performed on the textile.

3,746,506

CARBON FIBER TREATMENT

Ian Donald Aitken, Gordon Rhodes, and Raymond Anthony Philip Spencer, London, England, assignors to National Research Development Corporation, London, England

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,833

Claims priority, application Great Britain, Sept. 23, 1970, 45,411/70

Int. Cl. D06l *3/06*

U.S. Cl. 8—108 7 Claims

The adhesion of carbon fibers to the matrix in which they are incorporated is improved by immersing the carbon fibers in an aqueous solution of hypochlorous acid preferably containing from 1.0% to 3.0% by weight of available chlorine, having a pH of from 3.0 to 7.5, particularly from 4.0 to 6.0.

3,746,507

SOLVENT DYEING COPOLYESTER FIBERS

Colin L. Browne, Charlotte, N.C., and Terry A. Brodof, Lincroft, N.J., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed June 29, 1971, Ser. No. 158,123

Int. Cl. D06b *3/00*

U.S. Cl. 8—174 8 Claims

A process for the preparation of a deep-dyed polyester fiber with good bulk and hand in which a polyester fiber derived from ethylene glycol, dimethyl terephthalate and from about 1 to about 15 weight percent of a difunctional dye opener has applied to it a chlorinated hydrocarbon comprised of from about 0.3 to about 10 percent (by weight of chlorinated hydrocarbon) of disperse dye and from about 0.1 to about 10 percent (by volume of chlorinated hydrocarbon) of water.

3,746,508

PROCESS FOR REMOVING SOIL FROM LAND FOR TREATING CLEANING MOPS AND RAGS

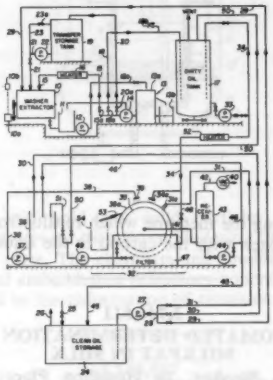
Steven Landon, Huntington, N.Y., assignor to Washex Machinery Corporation, Plainview, N.Y.

Filed Mar. 29, 1971, Ser. No. 128,926

Int. Cl. B08b *7/00*

U.S. Cl. 8—141 5 Claims

There is disclosed an apparatus and method for cleaning and processing highly soiled articles, such as commercial oil-impregnated dust mops and cleaning cloths, in a closed, relatively pollution-free cycle in which the soiled work is cleaned by immersion and tumbling in large volumes of the impregnating oil medium in a succession of cycles and in which a plurality of reservoirs of the oil medium are maintained having different degrees of soil impurity and in which the most contaminated batch is recycled through a continuous filter utiliz-



ing an expendible filtering medium and a vacuum to achieve a dry waste disposal composed of inert filtering material, inert soil, and insignificant quantities of residual oil.

3,746,509

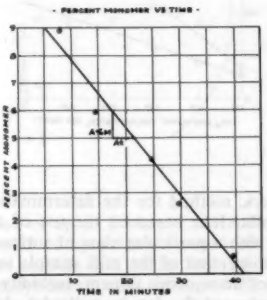
GAS CHROMATOGRAPHY ANALYSIS OF POLYMER

Larry P. Koskan, Orland Park, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Sept. 20, 1971, Ser. No. 182,031

Int. Cl. G01n *31/08*

U.S. Cl. 23—230 R 2 Claims



Gas-liquid chromatographic process to determine the reaction rate of a vinyl addition polymerization process.

3,746,510

METHOD OF SEPARATING CARBON FROM ALKALI AND ALKALI EARTH METALS

Jurgen Jung, Bensberg, Germany, assignor to Interatom Internationale Atomreaktorbau G.m.b.H., Bensberg, Cologne, Germany

Filed June 30, 1971, Ser. No. 158,248

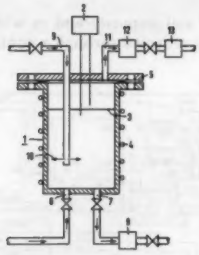
Claims priority, application Germany, July 23, 1970, P 20 36 558.6

Int. Cl. G01n *33/20*

U.S. Cl. 23—230 R 6 Claims

A method of separating carbon from alkali and alkali earth metals. This method is particularly suitable for detecting and measuring carbon activity in the metal. The

method comprises passing a hydrogen containing gas through a liquid alkali or alkali earth metal and thereafter separating the methane which results from the reaction of hydrogen with the carbon in the liquid metal.



3,746,511

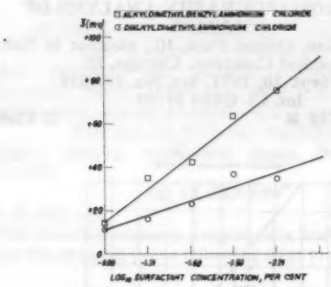
AUTOMATED DETERMINATION OF MILKFAT IN MILK

Lawrence L. Stookey, 26 Hamilton Place; and Aldo Conetta, 13 Glenwolde, both of Tarrytown, N.Y. 10591; and Hans Zehnder, Upper Shad Road, Pound Ridge, N.Y. 10576

Filed Nov. 1, 1971, Ser. No. 194,358

Int. Cl. G01n *33/06*

U.S. Cl. 23—231 **17 Claims**



Turbidimetric method for the determination of the fat content of milk. It is based on the use of acetic acid in combination with a particular class of surfactants to form a particular dispersion of the milk sample in which, after the addition of an aqueous diluent, turbidity is due solely to the dispersion of the fats as colloidal globules.

3,746,512

APPARATUS AND METHOD FOR DETERMINING THE ALCOHOLIC CONTENT OF BREATH

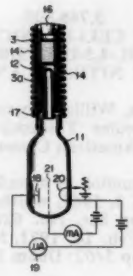
Hisashi Kamei and Junji Koezuka, Tokyo, and Masanori Imooka, Kanagawa-ken, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 14, 1971, Ser. No. 162,443

Int. Cl. G01n *27/70, 33/16*

U.S. Cl. 23—232 E **13 Claims**

An apparatus and method for determining the alcoholic content of breath comprising an alcohol adsorbent; means for heating the adsorbent; a hydrogen gas filter consisting of, for example, palladium; means for heating the filter; a guide pipe for conducting the hydrogen thermally decomposed from alcohol to the hydrogen gas filter; and a vacuum vessel provided with a device for determining the amounts of hydrogen permeating the filter.



3,746,513

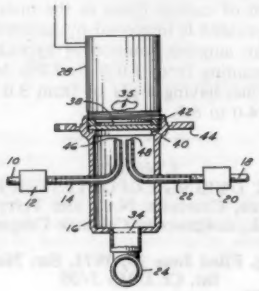
CHEMILUMINESCENT PROCESS

Alan Warnick and Alex David Colvin, Oak Park, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 26, 1971, Ser. No. 146,929

Int. Cl. G01n *27/68*

U.S. Cl. 23—232 R **16 Claims**



Concentrations of nitric oxide in gaseous mixtures are determined by measuring the chemiluminescence of the reaction between the nitric oxide and ozone. The gaseous mixture is introduced with virtually laminar flow into a reaction chamber at a location proximate to the inner surface of a light transmitting element. Reaction chamber pressure preferably is maintained above about 5 torr.

3,746,514

CHEMILUMINESCENT INSTRUMENT

Alex David Colvin and Alan Warnick, Oak Park, Mich., assignors to Ford Motor Company, Dearborn, Mich.

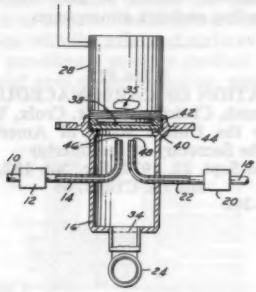
Filed May 26, 1971, Ser. No. 146,927

Int. Cl. G01n *27/68*

U.S. Cl. 23—254 R **17 Claims**

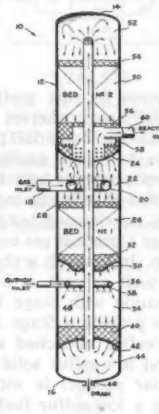
Gaseous mixtures containing an unknown quantity of nitric oxide are introduced into a cylindrical reaction chamber at a location proximate to the inner surface of a light transmitting element forming one end of the reaction chamber. Ozone also is introduced into the reaction cham-

ber and the chemiluminescence transmitted through the light transmitting element from the resulting reaction is



measured with a photomultiplier tube. Reaction chamber pressure preferably is maintained above about 5 torr.

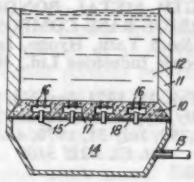
3,746,515
TWO-STAGE HIGH TEMPERATURE SHIFT REACTOR
George Friedman, Clark, N.J., assignor to The Lummus Company, Bloomfield, N.J.
Filed Oct. 13, 1971, Ser. No. 188,970
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 R **6 Claims**



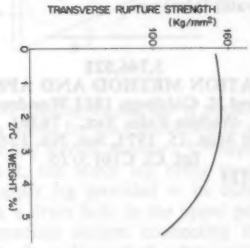
A high-temperature high-pressure reactor vessel, such as a shift reactor for synthesis gas. A vertical shell is provided with a first stage catalyst bed therein disposed above a quench chamber and below a second stage catalyst bed. The gas is conducted downward in series through the first bed and the quench, upward via a central riser tube and then downward through the second stage bed for exit from the shell.

3,746,516
SOLE PLATE FOR FLUIDIZED BED REACTOR
André Louis Michaud, Vieux Thann, France, assignor to Fabriques de Produits Chimiques de Thann et de Mulhouse, Haut-Rhin, France
Filed Mar. 10, 1971, Ser. No. 122,790
Claims priority, application Great Britain, Mar. 10, 1970, 11,499/70
Int. Cl. B01j *9/18*; B05b *1/14*
U.S. Cl. 23—291 **8 Claims**

A support plate for a fluidized bed reactor has internally located chambers, each provided with at least one inlet and outlet conduit which are not in line with one another; the plate face which will be in contact with the fluidised bed is substantially flat and the inlet conduit opens into the chamber inwardly of the associated chamber walls to provide a trap zone surrounding the inlet conduit which will hold any solid particles entering the chamber and prevent them from hindering the flow of gas through the plate. The chambers and conduits may be of stainless steel embedded in refractory concrete. The plate may be used in the chlorination of titanium ores.



3,746,517
HARD SINTERED COMPOSITION
Susumu Yamaya, Tokyo, and Takeshi Sadahiro, Yokohama, Japan, assignors to Toshiba Tungaloy Co., Ltd., Tsukagoshi, Kawasaki-shi, Japan
Filed Feb. 28, 1972, Ser. No. 229,960
Claims priority, application Japan, Dec. 23, 1971, 46/104,193
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.7 **4 Claims**



The addition of up to 5 wt. percent zirconium carbide to hard sintered compositions, formed of titanium carbide, tungsten carbide and 10 to 50% of binding alloys containing molybdenum and iron, cobalt or nickel, to be used in cutting tools for machining metals reduces cratering and plowing when machining metals at high speeds.

3,746,518
ALLOY COMPOSITION AND PROCESS
Frederick C. Holtz, Jr., Evanston, Ill., assignor to Crucible, Inc.
No Drawing. Filed Feb. 26, 1965, Ser. No. 435,733
Int. Cl. C22c *39/06*
U.S. Cl. 29—182.7 **31 Claims**

Fully dense consolidated powder alloys of iron, cobalt and/or nickel characterized by having an ultrafine microstructure exhibiting a substantially uniformly dispersed hardening phase of particle size essentially less than 3 microns, are produced from prealloyed powders by rapidly

quenching an atomized molten alloy charge and subjecting the solidified alloy powder particles to the step of hot consolidation to produce substantially fully dense metal stock directly from prealloyed powder.

3,746,519

HIGH STRENGTH METAL BONDED TUNGSTEN CARBIDE BASE COMPOSITES

Akio Hara and Syuji Yazu, Hyogo, Japan, assignors to Sumitomo Electric Industries Ltd., Higashi-ku, Osaka-shi, Japan

Filed Feb. 18, 1971, Ser. No. 116,622
Claims priority, application Japan, Feb. 18, 1970, 45/13,399; July 31, 1970, 45/67,646
Int. Cl. B22f *3/00*
U.S. Cl. 29—182.7 **6 Claims**

A high strength and tough sintered tungsten carbide base composite consisting essentially of metal carbides, containing tungsten carbide as a principal component, and from 10 to 50 weight percent of a steel binder consisting essentially of 4 to 30 weight percent nickel and/or 1 to 25 weight percent cobalt, 1 to 15 weight percent molybdenum and/or 1 to 10 weight percent chromium.

3,746,520

DI(HYDROCARBON SUBSTITUTED)POLYAMINE FUEL DETERGENTS

Enver Mehmedbasich, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation of abandoned application Ser. No. 750,765, Aug. 7, 1968. This application Dec. 7, 1970, Ser. No. 95,962
Int. Cl. C10l *1/22*
U.S. Cl. 44—58 **6 Claims**

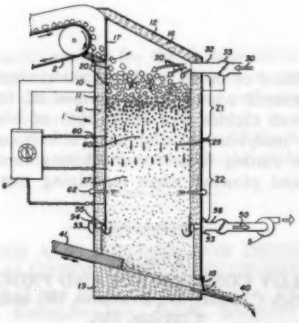
Bis(oil solubilizing hydrocarbon) substituted alkylene polyamines having from 2 to 5 amine nitrogen atoms, wherein the oil solubilizing hydrocarbon groups are of from 25 to 50 carbon atoms, are effective fuel detergents having good water tolerance.

3,746,521

GASIFICATION METHOD AND APPARATUS

Edward H. Giddings, 1811 Woodrow St., Wichita Falls, Tex. 76301

Filed Mar. 15, 1971, Ser. No. 124,123
Int. Cl. C10j *3/16*
U.S. Cl. 48—111 **4 Claims**



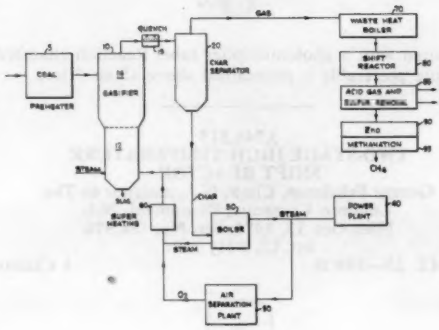
A gasification method and apparatus employing continuous concurrent unidirectional flow of gaseous and solid materials through a closed reaction chamber. The solid materials form a deep bed of moving material which is permeable to the flowing gases and within which are successive oxygenation and gasification zones. The concurrent movement of gases and solids through the deep bed provides residence times particularly suitable for gasification of nonhomogeneous solid wastes or refuse. Use of gas extraction means provides for operation of the reaction chamber at pressures less than that of the surrounding ambient atmosphere.

3,746,522

GASIFICATION OF CARBONACEOUS SOLIDS

Ernest E. Donath, Christiansted, St. Croix, Virgin Islands, assignor to the United States of America as represented by the Secretary of the Interior

Filed Sept. 22, 1971, Ser. No. 182,652
Int. Cl. C10j *3/46*
U.S. Cl. 48—202 **8 Claims**



A continuous process for the gasification of carbonaceous solids, especially coal, wherein a solid, low-sulfur fuel and methane rich gas comprise principal products. The process employs two-stage gasification, each stage characterized by super-pressures and high temperatures. In Stage 1, a low-sulfur char is reacted with oxygen and superheated steam at an elevated temperature and pressure to provide a Stage 1 product gas comprising oxides of carbon and hydrogen. In Stage 2 a charge comprising a carbonaceous solid, such as coal, is heated and reacted under methane formation with Stage 1 product gas and superheated steam to provide a Stage 2 product gas and char which are thereafter quenched and separated for providing gaseous and low-sulfur solid char products. A part of the solid char product is withdrawn from the process for providing a low-sulfur fuel for a boiler fuel and the remaining part is recycled to Stage 1 and there reacted with oxygen and superheated steam for providing additional Stage 1 product gases. The withdrawn char product is burned in a boiler for providing process steam and the gaseous Stage 2 product is further treated for providing methane-rich fuel gas and sulfurous by-product.

3,746,523

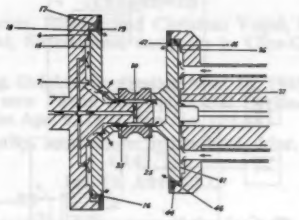
DEVICE FOR HOLDING A RING-FORMED WORKPIECE

Erik Lennart Waldemar Johansson, Goteborg, Sweden, assignor to Lidkopings Mekaniska Verkstads AB, Lidkoping, Sweden

Filed June 15, 1971, Ser. No. 153,388
Claims priority, application Sweden, June 18, 1970, 8,480/70
Int. Cl. B24b *41/04*
U.S. Cl. 51—236 **4 Claims**

Apparatus for performing machining operations on a workpiece, a device for supporting the ring-formed workpiece having inner and outer envelope surfaces and transversely disposed substantially flat axial end surfaces comprising a pair of opposed workholding members confront-

ing the axial end surfaces of the workpiece, each workholding member have an element for engaging the workpiece and mounted for floating movement in the workholding member, fluid pressure means for maintaining the element of each of said workholding members in pressure applying relation with the axial end surfaces of the workpiece, thereby providing a pressure medium cushion support at both axial ends of the workpiece, means for rotat-



ing one of said workholding members thereby to effect rotation of the workpiece, a mandrel engageable interiorly of the workpiece and spaced from the inner envelope surface to define an annular space therebetween and fluid medium connected to a suitable pressure source for pressurizing said annular space whereby inner envelope surface of the workpiece is completely out of engagement with said mandrel.

3,746,524

METHOD OF AND APPARATUS FOR THE PRODUCTION OF PADS OR MATS OF FIBERS FROM THERMOPLASTIC MATERIALS

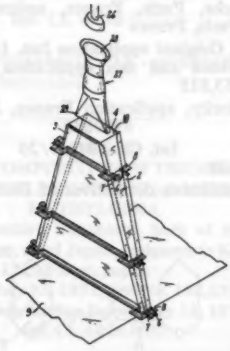
Jean-Jacques Kirchheim, Saint Maur-des-Fosses, France, assignor to Saint-Gobain, Neuilly-sur-Seine, France

Filed Sept. 15, 1971, Ser. No. 180,758

Claims priority, application France, Sept. 18, 1970, 7033875

Int. Cl. C03b *37/04, 37/06*

U.S. Cl. 65—6 **22 Claims**



The invention relates to the production of homogeneous and structurally resistant sheets or mats of thermoplastic fibers, such as glass fibers, issuing from a rotary centrifuge above a travelling conveyor. The molten filaments, discharged in radial directions in substantially horizontal planes, are transformed into fibrous form by a downwardly directed annular attenuating gaseous blast, and the resulting annular curtain of fibers is guided through a shaping assembly comprising a tuyere having a circular inlet and an elongated rectangular outlet with substantially elliptical intermediate sections of increasing flatness therebetween in the direction of travel of the curtain of fibers. The flattened curtain of fibers then passes through a shaping member formed essentially of a pair of large trapezoidally-shaped plane surfaces of predetermined spacings therebetween to obtain critical cross-sectional areas at its inlet and outlet as well as at intermediate portions thereof, with convergent portions between said surfaces, as well as provisions for the introduction of air into the interior thereof, which aid in the conveyance of the fibers to the outlet of said shaping member in proximity to the conveyor, whereon they are deposited smoothly across substantially the entire width thereof without the formation of lumps or nodules.

3,746,525

COOLING FINS

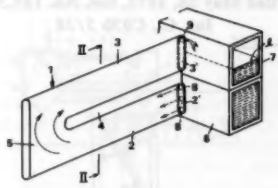
Kesaharu Kasuga, Tokyo, and Takeo Abe and Tsunehiro Haga, Koriyama, Japan, assignors to Paramount Glass Mfg. Co., Ltd., Koriyama, Fukushima-ken, Japan

Filed July 14, 1971, Ser. No. 162,563

Claims priority, application Japan, July 16, 1970, 45/62,409

Int. Cl. F03b *17/00, 37/00*

U.S. Cl. 65—12 **6 Claims**



An improved cooling fin for use in proximity to multi-orifice bushing plates for the production of glass filaments comprising a body having therein a U-shaped conduit for a liquid coolant, the lower leg being open for inlet of coolant, the upper leg provided at its outer end with a closure having a drain hole in the upper portion thereof, and an intermediate section connecting the upper and lower legs. The fin is formed of a heat-resisting metal of good thermal conductivity and the conduit preferably has a cross-section in the form of a narrow or flattened ellipse. To increase the heat absorption effect, the upper leg may be provided with a vertical extension, or fin piece, of solid metal. The lower leg and the upper leg are adapted for connection to a coolant supply and a coolant outlet respectively.

3,746,526

METHOD FOR FORMING SUBSURFACE FORTIFIED LAMINATES

James W. Giffon, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

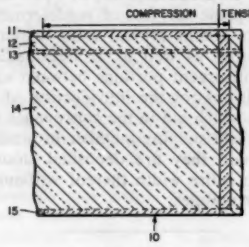
Original application June 6, 1968, Ser. No. 735,115. Divided and this application Mar. 10, 1971, Ser. No. 128,612

Int. Cl. C03b *5/26, 5/32*

U.S. Cl. 65—121 **2 Claims**

This invention relates to high strength glass, glass-ceramic, or glass and glass-ceramic laminates having subsurface fortification whereby a crack resulting from the fracture of an outer compressively stressed layer of the

laminate is prevented from propagating throughout the entire cross section of the laminate by a subsurface fortification comprising at least one internal compressively stressed layer.

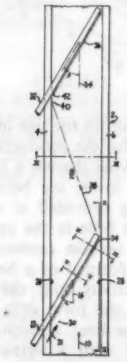


3,746,527

METHOD AND APPARATUS FOR HOMOGENIZING VISCOUS MOLTEN GLASS

Leonard A. Knavish, Pittsburgh, and Arnold J. Goldberg and William G. Hilliard, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 20, 1971, Ser. No. 145,340
Int. Cl. C03b 5/18
U.S. Cl. 65—136 16 Claims



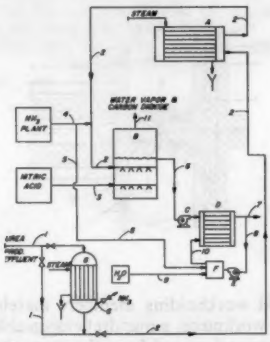
Substances are mixed into liquid flowing viscously in a channel or passage by means of gas-curtain mixer devices of the kind taught in British Pat. No. 1,171,133. Two such devices are used, extending transversely of the channel or passage and at an angle of 10 to 80 degrees with respect to the flow of liquid. The upstream mixer device extends only about 88 to 98.5 percent of the way across the passage or channel; the downstream mixer device extends all the way across the channel. This yields an improved mixing action. The foregoing concept is applied to the mixing of colorant into molten glass traveling in the forehearth of a container-glass tank. This requires particular conditions of the use of the mixer devices with respect to gas-impingement angle, spacing between the devices, and orientation angle of the devices with respect to the flow of the glass.

3,746,528

UTILIZATION OF UREA PRODUCTION EFFLUENTS

Edward Robert Johnson, Hopewell, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 20, 1971, Ser. No. 135,679
Int. Cl. C05c 9/00
U.S. Cl. 71—30 1 Claim



A crude effluent from urea production containing urea, carbon dioxide, ammonia and water is injected into a neutralizer where it is reacted with nitric acid at about 125–175° C. to form a marketable urea-ammonium nitrate fertilizer solution. The pH conditions in the neutralizer must be carefully controlled to avoid excess hydrolysis of the urea. A significant portion of the water in the effluent is vaporized by the heat of reaction of nitric acid and ammonia. If desired, product ratio of ammonium nitrate to urea may be adjusted by adding ammonia to the system or driving off part of the ammonia from the urea production effluent.

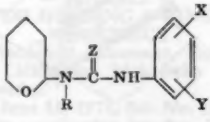
3,746,529

HERBICIDAL COMPOSITIONS OF NEW UREA AND THIOUREA DERIVATIVES

Daniel Bertin, Montrouge, and Jacques Perronnet and André Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application Jan. 14, 1970, Ser. No. 2,975. Divided and this application June 16, 1971, Ser. No. 153,815
Claims priority, application France, Jan. 20, 1969, 6900886
Int. Cl. A01n 9/20
U.S. Cl. 71—88 21 Claims

Urea and thiourea derivatives of Formula I:



(I)

wherein R represents a lower alkyl radical, X and Y, identical or different, are selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, a nitro radical, a trifluoromethyl radical, a lower alkyloxy radical, a lower alkyl radical, a lower alkenyloxy radical, a halogen-substituted lower alkenyloxy radical, a lower alkyloxycarbonyl radical, a lower alkylthio radical, a

lower alkylsulfinyl radical and a lower alkylsulfonyl radical, and Z is selected from the group consisting of an oxygen atom and a sulfur atom, process for their preparation, compositions containing them, and pesticidal method. The derivatives of Formula I possess pesticidal, particularly herbicidal properties.

3,746,530

HERBICIDAL 4-METHOXY-2,6-DIAMINO-s-TRIAZINES

Dagmar Berrer, Riehen, and Christian Vogel, Binningen, near Basel, Switzerland, assignors to Ciba-Geigy Corporation

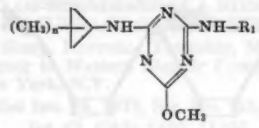
No Drawing. Original application Mar. 14, 1969, Ser. No. 807,430, now Patent No. 3,629,258. Divided and this application Apr. 9, 1971, Ser. No. 132,883

Claims priority, application Switzerland, Mar. 20, 1968, 4,149/68

Int. Cl. A01n 9/22

U.S. Cl. 71—93 **7 Claims**

Methoxy-triazine derivatives of the formula



wherein *n* means 0 or 1, and R_1 represents certain unsubstituted or substituted alkyl or cycloalkyl groups are disclosed as herbicidally active compounds of enhanced toxicity to undesirable plant growth and improved selectivity. A method of controlling undesirable plant growth with the aid of such compounds and compositions containing them are also described.

3,746,531

N-(2,2-DIFLUOROALKANOYL)-2,3-PYRIDINEDIAMINE COMPOUNDS

George O. P. Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 822,042, May 5, 1969. This application Mar. 20, 1970, Ser. No. 21,536

Int. Cl. A01n 9/22

U.S. Cl. 71—94 **15 Claims**

N-(2,2 - difluoroalkanoyl) - 2,3 - pyridinediamine compounds useful as herbicides.

3,746,532

HERBICIDAL COMPOSITION OF THIOCARBAMATE AND 3(3,4-DICHLOROPHENYL)-1-METHOXY-1-METHYLUREA

Ichiro Kimura; Yoshiro Takahashi, both of Shizuoka, and Hideo Ito, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

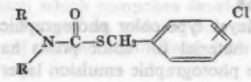
Filed July 13, 1971, Ser. No. 162,259

Claims priority, application Japan, July 16, 1970, 45/61739

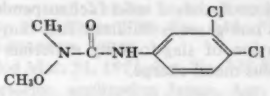
Int. Cl. A01n 9/02

U.S. Cl. 71—100 **10 Claims**

A herbicidal composition having synergistic properties is prepared by combining a thiocarbamate having the general formula:



wherein R is a lower alkyl group, and 3(3,4-dichorophenyl)-1-methoxy-1-methylurea, having the formula:



3,746,533

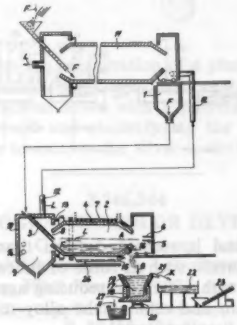
PROCESS OF PRODUCING FERRO-NICKEL IN A ROTARY FURNACE INCLUDING PELLETIZING AND PRE-REDUCING ORE

Lucas Sofoclis Moussoulos, 1 Rue Tsacalof, Athens, Greece

Continuation-in-part of abandoned application Ser. No. 24,073, Mar. 31, 1970. This application Mar. 22, 1972, Ser. No. 237,114

Int. Cl. C21b 1/08

U.S. Cl. 75—3 **12 Claims**



Ferro-nickel of high nickel content is produced from iron ore of low nickel content by mixing and grinding solid carbonaceous fuel with the ore, and nodulizing to form homogeneous pellets which are then heated to a temperature of 1000 to 1200° C. in a slightly oxidizing atmosphere to form an outer shell of Fe_2O_3 on each pellet. The proportion of carbonaceous fuel initially mixed with the ore is such that in the resulting heat-treated pellets the nickel is in the metallic state, not more than 6% of the iron is in the metallic state, 70 to 85% of the iron is present as FeO, and the remainder as Fe_2O_3 concentrated in the outer shells, and the carbon content is not more than 1%. The resulting pellets are charged into a rotary furnace and there heated to a temperature of 1450 to 1550° C. by the flame of at least one burner, and the resulting molten alloy and slag are then separated.

3,746,534

METHOD OF TREATING FERROUS METALS WITH OXYGEN CONTAINING A NON-GASEOUS FLUIDIZED FUEL

Andrew G. Szekely, Tonawanda, N.Y., assignor to Union Carbide Corporation

Filed Mar. 31, 1964, Ser. No. 356,172

Int. Cl. C21c 7/00

U.S. Cl. 75—60 **2 Claims**

A process for manufacturing steel, including the refining step of top-blowing a molten ferrous charge with at least one oxygen stream, wherein a non-gaseous fluidized

fuel is introduced into said oxygen stream continuously throughout the refining step in an amount sufficient to suppress iron oxide fume formation, and said non-gaseous fluidized fuel comprises a solid fuel suspended in a liquid carrier. Said non-gaseous fluidized fuel may also contain a fine dispersion of slag-forming materials for injection into the ferrous metal charge.

3,746,535

DIRECT REDUCTION PROCESS FOR MAKING TITANIUM

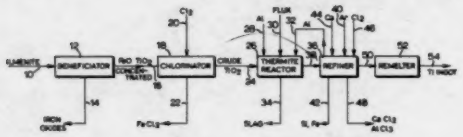
Hans G. Brandstatter, Welland, Ontario, Canada, assignor to Ontario Research Foundation, Sheridan Park, Ontario, Canada

Filed June 4, 1971, Ser. No. 149,940

Claims priority, application Great Britain, June 8, 1970, 27,704/70

Int. Cl. C22b *53/00*

U.S. Cl. 75—84.5 **16 Claims**



Titanium metal is recovered from titanium dioxide-containing materials, such as rutile or ilmenite, by reduction of the ore with a metallic reducing agent to form an alloy of titanium and refining the alloy to recover substantially pure titanium metal.

3,746,536

SEALING ALLOY

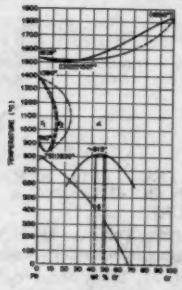
Takashi Kuse, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 4, 1971, Ser. No. 168,824

Claims priority, application Japan, Aug. 7, 1970, 45/68,643, 45/68,644; Dec. 26, 1970, 45/119,088

Int. Cl. C22c *39/10, 39/20*

U.S. Cl. 75—124 **2 Claims**



A sealing alloy comprising 15–30% by weight of Cr, 0.001–2.0% by weight of a rare earth metal and balance of Fe is provided. This alloy has excellent corrosion resistance.

3,746,537

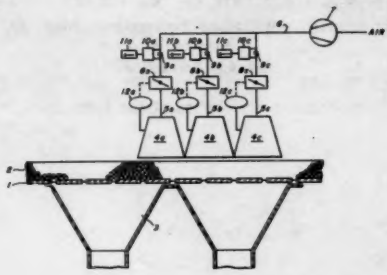
PROCESS AND APPARATUS FOR THE CONTROL OF THE SPEED OF MOVEMENT OF SINTER STRAND

Heinz Eugen Haibach, Eltville, Germany, assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1971, Ser. No. 175,597

Int. Cl. F27b *21/02*

U.S. Cl. 75—200 **12 Claims**



A process and apparatus for regulating the speed of movement of a sinter strand, upon which sinterable material is disposed, with the speed of movement of the sinter strand being controlled so that the burn-through point of the sinter mixture is accurately determined along the length of the sinter strand. The gas permeability of the sinter mixture is measured at at least two points along the sinter strand and used to generate signals which are a function of the gas permeability, which signals are compared to produce a control signal for controlling the speed of the sinter strand, whereby the position of the burn-through is controlled.

3,746,538

IMAGE TRANSFER PROCESS

Elsie L. Menz, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,330

Int. Cl. G03g *13/22, 17/00*

U.S. Cl. 96—1.4 **23 Claims**

A method of removing background image material from an image bearing substrate by means of coulombic attraction and the rearrangement of electrical charges.

3,746,539

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS FOR COLOR PRINTS SHOWING EXCELLENT COLOR REPRODUCTION

Hideki Ohmatsu and Hirozo Ueda, Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Kanagawa, Japan

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,933

Claims priority, application Japan, Feb. 9, 1971, 46/5,403

Int. Cl. G03c *1/14, 1/16, 1/18*

U.S. Cl. 96—68 **13 Claims**

A multiple layer type color photographic silver halide light-sensitive material for color prints having at least a blue-sensitive photographic emulsion layer in which the

spectral sensitivity of the blue-sensitive silver halide emulsion layer is limited to the region of about 440 to about 460 nm., in which at least one dye having its absorption maximum at a wavelength region shorter than about 440 nm. and/or in a region of about 460 to about 520 nm. is incorporated in the blue-sensitive photographic emulsion layer of the light-sensitive material and/or in a layer coated on the blue-sensitive photographic emulsion layer.

3,746,540

TONE REPRODUCTION IN SCREEN PRINTING

Kenneth W. Rarey, South Holland, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 20, 1965, Ser. No. 498,599

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.4 **17 Claims**

A stencil for electrostatic screen reproduction of halftone printing and methods of producing such a stencil including the production of contact screens by novel methods.

3,746,541

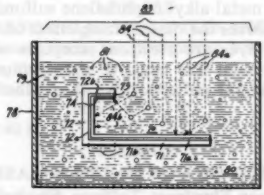
METHOD OF IRRADIATING A NON-LINE-OF-SIGHT SURFACE OF A SUBSTRATE

Donald Jex Sharp, Lawrence Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,405

Int. Cl. G03c *5/00, 11/00*

U.S. Cl. 96—38.4 **11 Claims**



A method of irradiating a non-line-of-sight surface of a substrate comprises placing a suitable mixture contiguous to the surface. A suitable mixture is one comprising a transmitting medium and a radiation direction-altering medium dispersed therethrough. A source of a desired radiation is directed at the mixture. The desired radiation is transmitted by the transmitting medium and a portion of the transmitted radiation is dispersed, reflected and/or refracted by the radiation direction-altering medium to the non-line-of-sight surface.

3,746,542

PROCESS FOR THE PRODUCTION OF POLYMER IMAGES

Yoshihide Hayakawa and Masato Satomura, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,597

Claims priority, application Japan, Dec. 10, 1968, 43/90,350

Int. Cl. G03c *1/70*

U.S. Cl. 96—48 R **29 Claims**

Process for selectively forming polymer images at the latent image-bearing areas of a silver halide photographic emulsion which comprises developing said emulsion in the presence of an addition-polymerizable monomer and any of various hydrazines, hydrazones or hydrazides.

3,746,543

PROCESS FOR THE REGENERATION OF FIXING PHOTOGRAPHIC SOLUTION

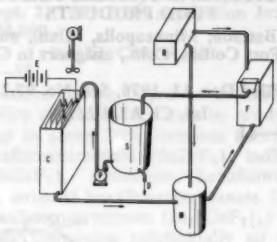
Haruhiko Iwano and Yutaka Inaba, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

Filed Mar. 31, 1971, Ser. No. 129,836

Claims priority, application Japan, Apr. 2, 1970, 45/28,169

Int. Cl. G03c *5/38, 5/26*

U.S. Cl. 96—61 R **5 Claims**



A process for the regeneration of a photographic fixing solution comprising contacting the used fixing solution containing dissolved silver with a polyethylene glycol or derivative thereof and electrolyzing the thus contacted fixing solution to recover the silver is disclosed.

3,746,544

PHOTOGRAPHIC COLOR DEVELOPER

Max Heilmann, Cologne, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 23, 1971, Ser. No. 127,362

Claims priority, application Germany, Apr. 1, 1970, P 20 15 403.4

Int. Cl. G03c *5/30, 7/00*

U.S. Cl. 96—66.4 **4 Claims**

A photographic color developer mixture, which contains a color developer of the p-phenylene diamine series and a water softener of the aminopolycarboxylic acid series and in addition a water-soluble aromatic polyhydroxy compound having at least two hydroxyl groups in ortho-position to each other, has improved stability to atmospheric oxygen and does not deposit chalky precipitates.

3,746,545

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Robert Joseph Pollet, Vremde, Jozef Frans Willems, Wilrijk, Francis Jeanne Sels, Kontich, and Herman Adelbert Philippaerts, Mortsel, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

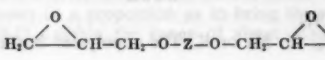
No Drawing. Filed May 17, 1971, Ser. No. 144,234

Claims priority, application Great Britain, June 11, 1970, 28,402/70

Int. Cl. G03c *5/30, 1/72, 1/06*

U.S. Cl. 96—66.3 **22 Claims**

A pocess is described for developing an exposed photographic silver halide element wherein the development is carried out in the presence of a water-soluble polymeric compound obtained by polyaddition of a dihydric alcohol of the formula HO—X—OH, X being arylene, a straight-chain or branched-chain C_2–C_8 alkylene, C_2–C_8 alkenylene or C_2–C_8 alkynylene group, cycloalkylene or alkylene-cyclo-alkylene, with a bisepoxide of the formula:



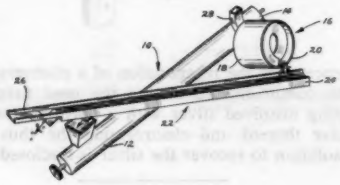
Z being a straight-chain or branched-chain C_2–C_8 alkylene group. The speed and developability of the silver halide element is substantially increased by the presence of this polyaddition compound. By infectious development of silver chloride and silver chlorobromide emulsions it is possible by means of these polyaddition compounds to obtain very contrasty line and screen images and sharply defined screen dots and to reduce the formation of peppers when using somewhat exhausted developing baths.

3,746,546

APPARATUS AND PROCESS FOR PUFFING FOOD PRODUCTS

Robert N. Bateson, Minneapolis, Minn., and Judson M. Harper, Fort Collins, Colo., assignors to General Mills, Inc.

Filed Dec. 11, 1970, Ser. No. 97,238
Int. Cl. A23l *1/18*
U.S. Cl. 99—81 **14 Claims**



An apparatus and process for continuously puffing pieces of food product with a heated granular material. The granular material is first heated, and then introduced into a puffing chamber along with the product to be puffed. As the product and the heated granular material are mixed together, heat is transferred to the product so that it puffs or expands in size. Thereafter, the product is separated from the granular material, the latter being reheated and again used for puffing additional product.

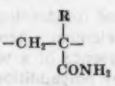
3,746,547

PROCESS FOR PRODUCING A PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

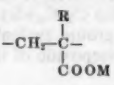
Nobuo Tsuji, Takushi Miyazako, Hirozo Ueda, and Yoshiako Ono, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara-shi, Kanagawa, Japan

No Drawing. Filed Nov. 9, 1971, Ser. No. 197,140
Claims priority, application Japan, Nov. 9, 1970, 45/98,535
Int. Cl. G03c *1/84*
U.S. Cl. 96—84 A **5 Claims**

Photographic elements with increased viscosity of gelatin layers containing an acid dye and a mordant for the dye are obtained by incorporating in the gelatin layer a copolymer of 30 to 70 mole percent



R=H or CH_3, and



R=H or CH_3

M=H, NH_4, Li, Na or K. The copolymer has a degree of polymerization of 1,500 to 50,000. A process for increasing the viscosity of gelatin/acid dye/mordant layer comprising adding such a copolymer thereto. An improved coating process using such a copolymer.

3,746,548

SILVER HALIDE EMULSION WITH GRAFT COPOLYMER BINDERS

Maurice J. Fitzgerald, Canton, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 8, 1971, Ser. No. 187,827
Int. Cl. G03c *1/04*
U.S. Cl. 96—113 **23 Claims**

A photosensitive silver halide emulsion wherein the emulsion binder comprises a graft copolymer of an amine acrylamide monomer on a polymer containing a plurality of hydroxyl groups.

3,746,549

SPECTRALLY SENSITIZED PHOTOGRAPHIC EMULSIONS

Daniel A. Corretore, Jr., Webster, and Cynthia G. Ulbing, Fairport, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 25, 1970, Ser. No. 92,895
Int. Cl. G03c *1/76*
U.S. Cl. 96—126 **8 Claims**

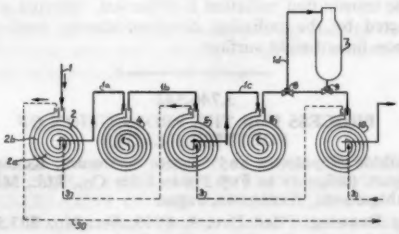
Spectral sensitization of negative silver halide emulsions is achieved by incorporating in the emulsion certain cyanine dyes which are known as strong desensitizers for negative emulsions and also including with the cyanine dye an alkali metal alkyl naphthalene sulfonate which unexpectedly reduces the desensitizing effect of the dye. Suitable cyanine dyes are electron acceptors which have a reduction potential less negative than minus 1.0 and an oxidation potential more positive than plus 0.4.

3,746,550

METHOD OF CONTINUOUS MASHING

Lars Karl Johan Ehnstrom, Tullinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 28, 1971, Ser. No. 193,518
Claims priority, application Sweden, Nov. 3, 1970, 14,807/70
Int. Cl. C12c *7/00*
U.S. Cl. 99—51 **7 Claims**



The mash is heated to a predetermined temperature which should be maintained uniformly throughout the mash while it passes through a holding zone where enzymatic reactions take place. For this purpose, the heated mash in the holding zone is caused to flow through a channel having an elongated cross-sectional area and which directs the flow in a helical path around a horizontal axis.

3,746,551

MARGARINE

John P. McNaught, Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 10,313, Feb. 10, 1970. This application Oct. 2, 1970, Ser. No. 77,757

Int. Cl. A23d *3/00*

U.S. Cl. 99—122 R 14 Claims

The specification describes a highly nutritive margarine containing a high proportion of polyunsaturated acids. The margarine is physically stable with respect to texture at deep-freeze storage temperatures (e.g., −10° F.) when at least 25% of the oil therein having a high polyunsaturated content has been randomly interesterified.

3,746,552

EDIBLE WHIPPABLE TOPPING COMPOSITIONS CONTAINING A POLYOXYALKYLENE DERIVATIVE OF A POLYGLYCEROL HIGHER FATTY ACID ESTER

Richard J. Zielinski, Middleburg Heights, and Cecilia Gilmore, Rock River, Ohio, assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Jan. 4, 1971, Ser. No. 103,857

Int. Cl. A23g *3/00*

U.S. Cl. 99—139 6 Claims

Edible whippable topping compositions of the nondairy type comprising fat, protein, water, and emulsifier, having excellent resistance of emulsion breakdown or phase separation on thawing after a freeze cycle are set forth. Such resistance is obtained by including as a part of the emulsifier in the composition a polyoxyalkylene derivative of a polyglycerol higher fatty acid ester.

3,746,553

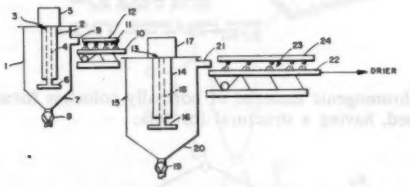
PROCESS FOR CLEANING SPICES AND HERBS

James E. Anderson, Paris, Tex., assignor to John Kraft Sesame Corporation, Paris, Tex.

Filed Mar. 24, 1971, Ser. No. 127,607

Int. Cl. A23l *1/22*

U.S. Cl. 99—140 R 8 Claims



Contaminants are removed from spices and herbs by a washing process using dilute alkaline cleaning solutions and neutralizing agents and passing the substances to be cleaned through concentric zones with countercurrent flow, thereafter spray rinsing and drying.

3,746,554

PROCESS FOR PREPARING A SPRAY DRIED LACTOSE AND SACCHARIN SWEETENER

Clarence J. Endicott, Waukegan, Ill., Paul W. Brown, Columbus, Ohio, and Leonard S. Andrews, Morton Grove, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 855,024, Sept. 3, 1969, which is a continuation-in-part of application Ser. No. 508,591, Nov. 18, 1965, now abandoned. This application July 23, 1971, Ser. No. 165,583

Int. Cl. A23l *1/26*

U.S. Cl. 99—141 A 7 Claims

A low bulk density sweetener having a sweetness equivalent to the sweetness of an equal volume of sucrose comprising lactose and saccharin and a process whereby the sweetener is produced by dissolution of the ingredients in water, injection of carbon dioxide into the solution and spray drying of the solution to form sweetener particles of low bulk density and stabilizing the sweetener particles by treating the same with certain organic solvents.

3,746,555

PROCESS FOR PRODUCING A DENTAL CEMENT AND PRODUCT PRODUCED THEREBY

Joseph C. Muhler, Indianapolis, Ind., assignor to Indiana University Foundation, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 854,794, Sept. 2, 1969. This application June 7, 1971, Ser. No. 150,800

Int. Cl. C09k *3/00*

U.S. Cl. 106—35 10 Claims

A dental cement having improved anticariogenic and cement solubility characteristics may be produced by incorporating up to about 20% stannous fluoride (SnF_2), stannous hexafluorozirconate ($SnZrF_6$), indium fluorozirconate ($InZrF_7$), zirconium hexafluorogermanate ($Zr[GeF_6]_2$), zirconyl hexafluorogermanate ($ZrOGeF_6$), or indium hexafluorogermanate ($In_2[GeF_6]_3$) in a dental cement powder containing substantially no magnesium oxide (MgO) after the powder has been heat-treated (i.e., sintered) and processed to its desired particle size. The dental cement powder is heat-treated in the presence of an oxide of tin as a condensing agent prior to the addition of the fluoride compound.

3,746,556

CHEMICALLY RESISTANT ALUMINOPHOSPHATE GLASSES

David W. Morgan, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,483

Int. Cl. C03c *3/12, 3/16, 3/30*

U.S. Cl. 106—47 R 7 Claims

Glasses resistant to chemical attack, in particular attack by fluorides, are disclosed. These are aluminophosphate base glasses containing one or more alkali metal oxides, with or without zinc or cupric oxide, as modifying oxides. The glass compositions consist essentially, on a mole percent basis, of 60–75% P_2O_5, 20–25% Al_2O_3, 1.5–12% R_2O, and 0–12% ZnO plus CuO, the total R_2O plus ZnO being at least 3%.

3,746,557

HARDENING AGENT FOR REFRACTORY USE AND PRODUCTION THEREOF

Eiki Shimazaki, Shunji Araki, and Hakuichi Akazawa, Kakogawa, Japan, assignors to Taki Fertilizer Manufacturing Co., Ltd., Kakogawa, Japan

Filed July 29, 1971, Ser. No. 167,343

Claims priority, application Japan, July 29, 1970, 45/66,322

Int. Cl. C04b *35/02*

U.S. Cl. 106—65 12 Claims

A novel hardening agent for refractory use in combination with a phosphate- or phosphoric acid-type binder is provided which comprises active aluminum hydroxide-borate complex in which the molar ratio, Al_2O_3/B_2O_3, lies within the range of about 1 to 24. The hardening agent is produced by a reaction, in the presence of a water of an aluminum compound selected from the group consisting of aluminum alcoholates and aluminum phenolate with a boric compound selected from the group consisting of boric acid, ammonium borate, alkali borates and boric esters in a proportion as to bring the molar ratio, Al_2O_3/B_2O_3, within the range of about 1 to 24.

3,746,558

SUSPENSIONS OF HYDROPHOBIC STARCH ESTERS

Frans Berkhout, Vries, and Hermanus Johannes Wilhelmus Nieuwenhuis, De Krim, Netherlands, assignors to Scholten-Honig Research N.V., Foxhol, Netherlands

No Drawing. Filed July 9, 1971, Ser. No. 161,923

Claims priority, application Great Britain, July 14, 1970, 33,991/70

Int. Cl. C08b *27/22*

U.S. Cl. 106—213 **4 Claims**

A stable colloidal aqueous suspension containing 50% by weight subgranular hydrophobic starch ester particles having a weight average size of 0.1–1.0 micron, the starch containing ester groups, in a proportion corresponding to a degree of substitution of 0.1–1.0, which consist of an aliphatic group of 3 to 17 carbon atoms and/or an aromatic group of 6–12 carbon atoms. The suspension is prepared by treating a granular starch ester under superatmospheric pressure and suddenly releasing the pressure. The suspensions can be used for coating paper, sizing yarns, and binding non-wovens.

3,746,559

ALKALI METAL ALUMINO SILICATES, METHODS FOR THEIR PRODUCTION AND COMPOSITIONS THEREOF

Lowell E. Hackbarth, Bel Air, Md., and Joseph T. Crockett, Auburn, Ala., assignors to J. M. Huber Corporation, Borger, Tex.

No Drawing. Continuation-in-part of application Ser. No. 730,892, May 21, 1968, now Patent No. 3,582,379. This application Feb. 3, 1971, Ser. No. 112,469

The portion of the term of the patent subsequent to June 1, 1988, has been disclaimed

Int. Cl. C09c *1/28, 1/40*

U.S. Cl. 106—288 B **2 Claims**

The subject matter of the following specification concerns the production of finely divided materials useful as pigments, moisture conditioners, paper fillers, and in rubber reinforcement and the like. Considering present economics, perhaps the most practical embodiment of the subject matter employs the reaction of a soluble sodium silicate and aluminum sulfate in producing precipitates commonly known and identifiable as sodium alumino silicates the precipitate being ultimately collected as a dried particulate material of sub-micron particle size. The disclosed process involves conducting this general type of reaction in the presence of calculated quantity of sodium sulfate from the outset of the reaction whereby economics are improved and highly refined modifications in the characteristic of the final materials become obtainable. The reaction may be varied according to several conditions, such as pH, temperature, concentration, manner of feeding materials and the like whereby to better adapt the new materials to highly specialized needs, such as in rubber compounding and paper production.

3,746,560

OXIDIZED CARBON FIBERS

John C. Goan and Louis A. Joo, Johnson City, Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

No Drawing. Filed Mar. 25, 1971, Ser. No. 128,166

Int. Cl. C08h *17/08, 17/10*

U.S. Cl. 106—307 **2 Claims**

Carbon fibers, surface oxidized after final carbonization by contact with an about 6 N aqueous oxygen-containing inorganic acid solution containing a soluble chlorate salt, improves fiber-resin interfacial bond in composites thereof.

3,746,561

STRIPPABLE COATING COMPOSITIONS

Travis L. Gordy, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Continuation-in-part of application Ser. No. 113,069, Feb. 5, 1971, which is a continuation-in-part of application Ser. No. 888,846, Dec. 29, 1969, both now abandoned. This application Feb. 25, 1972, Ser. No. 229,484

Int. Cl. C08f *45/52*

U.S. Cl. 117—6 **3 Claims**

This disclosure concerns compositions which are useful for providing a strippable, protective coating on various substrates (e.g., automobile moldings). The compositions consist essentially of petroleum wax, and a wax-compatible copolymer, which is an ethylene-ethyl acrylate copolymer, a mixture of ethylene-ethyl acrylate copolymers having different melt indexes, or a mixture of ethylene-ethyl acrylate copolymer and ethylene-isobutyl acrylate copolymer. A release agent is not essential to the compositions.

3,746,562

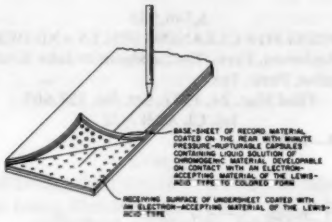
MARK-FORMING RECORD MATERIALS

Chao-Han Lin, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

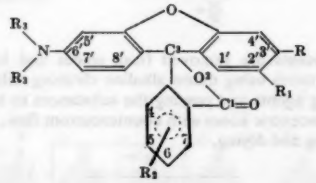
Application Nov. 16, 1970, Ser. No. 90,097, now Patent No. 3,681,390, which is a continuation-in-part of abandoned application Ser. No. 792,401, Jan. 21, 1969. Divided and this application Sept. 28, 1971, Ser. No. 184,582

Int. Cl. B41m *5/22*; C07d *5/34*

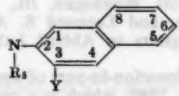
U.S. Cl. 117—36.2 **15 Claims**


BASE-SHEET OF RECORD MATERIAL COATED ON THE REAR WITH MINUTE PRESSURE-RUPTURABLE CAPSULES CONTAINING LIQUID SOLUTION OF CHROMOGENIC MATERIAL DEVELOPABLE ON CONTACT WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE TO COLORED FORM
RECEIVING SURFACE OF UNDERSHEET COATED WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE

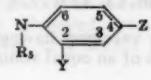
A chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein one of R_1 and R_2 represents a chemical radical having the structure



or a chemical radical having the structure



wherein R_3 represents an alkyl radical having less than five carbon atoms or hydrogen radicals, Z represents nitro-, amino-, dialkylamino-, alkyl radicals have less than five carbon atoms or hydrogen radicals, and Y comprises nitro-, amino-, carboxyl, hydrogen and ester radicals and the remaining other R_1 and R_2 comprises amino-, nitro-, hydrogen, alkyl having less than five carbon atoms, acetamido and halogen radicals; R comprises hydrogen radicals and alkyl radicals having less than five carbon atoms; and R_3 comprises alkyl radicals having less than five carbon atoms—said material assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include

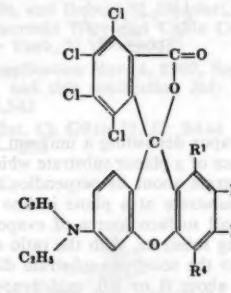
2'-(2-carboxyanilino)-6'-diethylaminofluoran;
2'-anilino-6'-diethylaminofluoran;
2'-(3-carbomethoxy-2-naphthylamino)-6'-diethylaminofluoran;
2'-(2-carbomethoxyanilino)-6'-diethylamio-3'-methylfluoran;
2'-(3-carboxy-2-naphthylamino)-6'-diethylamino-3'-methylfluoran;
6-(2-carboxyanilino)-2'-chloro-6'-diethylamino-3'-methylfluoran;
2'-(2-carboxy-4-nitroanilino)-6'-diethylaminofluoran;
6'-diethylamino-2'-(N-methylanilino)fluoran; and
6'-diethylamino-2'-(2,4-dinitroanilino)fluoran.

3,746,563
PRESSURE SENSITIVE RECORD SHEET EMPLOYING ALKYL OR HALO SUBSTITUTED TETRAHALOFLUORANS

Sheldon Farber and Arthur John Wright, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Original application Nov. 3, 1970, Ser. No. 86,641. Divided and this application Oct. 1, 1971, Ser. No. 185,827
Int. Cl. B41m *5/22*; C07d *5/34*
U.S. Cl. 117—36.2 **13 Claims**

A chromogenic material of normally colorless form is disclosed having the structural formula:



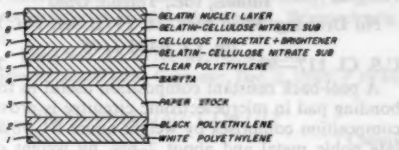
wherein each R^1, R^2, R^3 or R^4 is hydrogen, an alkyl radical having 1 to 4 carbon atoms or chlorine and at least one of said R groups is an alkyl radical or chlorine.

3,746,564
PHOTOGRAPHIC DIFFUSION TRANSFER PRODUCT AND PROCESS

Timothy F. Parsons, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,042
Int. Cl. B05c *9/04*
U.S. Cl. 117—68 **7 Claims**

A receiving sheet for use in a diffusion transfer process comprises a polyolefin surface such as polyethylene over which is coated a cellulose ester layer such as cellulose triacetate and over which is then coated an image receiving layer. The image receiving layer can be a nucleated



layer for use in black and white diffusion transfer or a mordanted layer for use in color diffusion transfer.

3,746,565
POLYAMIDE ARTICLES OF REDUCED VAPOR PERMEABILITY

Johannes Schneider and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel AG, Postfach, Germany

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,332
Claims priority, application Germany, Oct. 31, 1969, P 19 54 831.3
Int. Cl. B32b *27/08*
U.S. Cl. 117—94 **4 Claims**

Shaped articles of amorphous polyamides have their gas and water vapor permeability reduced by immersion in a 45–80:55–20 water-copolymer dispersion, the copolymer comprising 85–90:15–10 vinylidene chloride: ethyl acrylate, all by weight, followed by drying in warm air. The amorphous polyamide preferably comprises radicals of terephthalic acid, isophthalic acid or mixtures thereof and radicals of 2,2,4-trimethylhexamethylenediamine, 2,4,4-trimethylhexamethylenediamine, hexamethylenediamine, nonamethylenediamine or mixtures thereof; the shaped article may also comprise up to about 40% by weight of a partially crystallizable polyamide.

3,746,566
MAT FILM FOR WRITING

Nobuo Hiratsuka, Akiyasu Shihozawa, and Tokuji Iwamoto, Ashigara-machi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed July 2, 1971, Ser. No. 159,520
Claims priority, application Japan, July 6, 1970, 45/58,879
Int. Cl. B44d *5/02*; B32b *23/08*
U.S. Cl. 117—72 **6 Claims**

A mat layer comprising a fine powder of fused alumina and cellulose acetate resin on a plastic film is excellent in writing and erasing properties.

3,746,567
SILOXANE-UNSATURATED ESTER COATED PRODUCT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Original application Nov. 18, 1968, Ser. No. 776,765. Divided and this application Dec. 17, 1970, Ser. No. 99,249
Int. Cl. B44d *1/50*; B32b *15/08*; C08f *35/02*
U.S. Cl. 117—93.31 **8 Claims**

An article of manufacture comprising a substrate and an organic coating thereon crosslinked in situ by ionizing radiation and, prior to curing, consisting essentially of an alpha-beta olefinically unsaturation siloxane. The unsaturated siloxane is prepared by reacting a hydroxyalkyl ester of an alpha-beta olefinically unsaturated monocarboxylic acid with a siloxane having at least two functional groups selected from hydroxyl groups and alkoxy groups. The unsaturated siloxane can be prepared by a conventional condensation reaction.

3,746,568

NOBLE METAL, GLASS BINDER COMPOSITIONS AND METHODS OF USING SAME

Frederick Rybarczyk, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

No Drawing. Filed Mar. 11, 1971, Ser. No. 123,413

Int. Cl. B44d 1/46

U.S. Cl. 117—95 21 Claims

A peel-back resistant composition useful to form a die-bonding pad in microelectronic circuitry is provided. The composition comprises by weight about 94–98% particulate noble metal and about 2–6% by weight of a glass binder. The glass binder consists of a fritted particulate glass formed from a composition comprising by weight about; 75–89% PbO, 10–15% B_2O_3, 1–8% BaO and 0–6% SiO_2. The particulate composition is readily formed into a printing paste using an organic vehicle and is fireable at about 550–1000° C. to a nonpeeling pad or coating.

3,746,569

SILICON NITRIDE COATING ON QUARTZ WALLS FOR DIFFUSION AND OXIDATION REACTORS

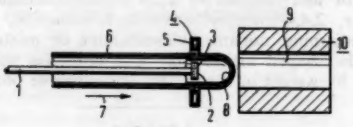
Erich Pammer and Eduard Folkmann, Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Germany

Filed Nov. 10, 1970, Ser. No. 88,390

Claims priority, application Germany, Nov. 18, 1969, P 19 57 952.3

Int. Cl. B44d 1/12

U.S. Cl. 117—97 8 Claims



A quartz tube for oxidation and reduction processes. The quartz tube has on its inner wall a passivating layer which is at least partially comprised of silicon nitride. The passivating layer is applied through pyrolysis of its respective compound.

3,746,570

METHOD FOR APPLICATION OF VISCOUS HOT MELT ADHESIVE

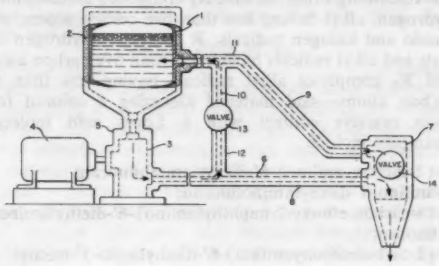
Kenneth W. McIntosh, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 837,068, June 27, 1969. This application July 22, 1971, Ser. No. 165,371

Int. Cl. B05c 11/10; B65d 5/62

U.S. Cl. 117—102 A 1 Claim

A method and apparatus for application of a viscous hot melt adhesive at an elevated temperature which comprises in a heated apparatus substantially encompassed by heating means, the steps of (a) applying a molten viscous hot melt adhesive at a temperature of from about 150° C. to about 300° C. and, in such molten state having a viscosity of from about 800 to about 200 poises, to a positive displacement pumping means, (b) dispensing the said molten hot melt adhesive continuously from the positive displacement pumping means, and (c) recycling at least a portion of the molten hot melt adhesive through the pumping means. This method and apparatus have particular utility for the application of high viscosity hot melt adhesives for rapidly securing adhesive bonds during the lasting of shoes, in construction of various articles and in packaging.



3,746,571

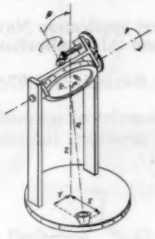
METHOD OF VACUUM EVAPORATION

William S. Little, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 29, 1971, Ser. No. 157,905

Int. Cl. C23c 13/00, 13/02, 13/04, 13/08

U.S. Cl. 117—105.4 4 Claims



A method of vapor depositing a uniform layer of material on the surface of a planar substrate which comprises rotating said substrate about its perpendicular axis while maintaining the substrate at a plane incline to the horizontal, with a small surface source of evaporant located below said rotating substrate, with the ratio of the radius of the substrate to the source-to-substrate distance being maintained from about 0 to 1.0, said evaporant source emitting a vapor flux of said substrate, while maintaining said substrate and evaporant source under vacuum conditions during the entire evaporation cycle.

3,746,572

PROCESS FOR FLAME RETARDING FABRICS

Edward D. Weil, Hastings-on-Hudson, Ralph B. Fearing, Bardonia, and Bernard J. Eisenberg, Nanuet, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Feb. 23, 1971, Ser. No. 118,166

Int. Cl. C09d 5/18

U.S. Cl. 117—136 34 Claims

The present invention provides a process for flame retarding textiles which comprises: (1) applying to a tex-

tile an aqueous solution consisting of (a) a phosphonate having at least one carbon-bonded primary alcohol group, (b) dimethyloldihydroxyethylene urea, and (c) a curing catalyst; and (2) curing the phosphonate and urea on the textile and thereby rendering the textile flame retardant.

3,746,573

METHOD FOR MANUFACTURING CARPET HAVING LOW STATIC CHARGE

Tetsuya Hotta, Kensuke Okuda, and Minoru Sugita, Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed Mar. 10, 1971, Ser. No. 123,029

Claims priority, application Japan, Mar. 12, 1970, 45/20,449

Int. Cl. C08j *1/44*

U.S. Cl. 117—139.5 C **3 Claims**

A method of producing carpet of low static charge, wherein a binder containing therein a quantity of carbon fiber is applied to the base cloth for the carpet as well as to the flocked fibers.

3,746,574

DIELECTRIC COPYING SHEET

Eckhard C. A. Schwarz, Neenah, and Philip R. Bartels, Oshkosh, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

No Drawing. Filed Oct. 22, 1971, Ser. No. 191,896

Int. Cl. G03g *5/00, 5/10*

U.S. Cl. 117—201 **7 Claims**

Improved lightweight dielectric copying sheet including a base of crazed polystyrene having a conductive resin coating.

3,746,575

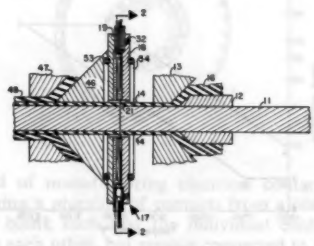
METHOD OF DETECTING HOLIDAYS DURING DUAL EXTRUSIONS

Edwin H. Arnaudin, Jr., Marion, Wilbert H. Christiansen, Indianapolis, and Robert M. Hazelett, Jr., Marion, Ind. (all % Anaconda Wire and Cable Company, 605 3rd Ave., New York, N.Y. 10016)

Original application Nov. 4, 1969, Ser. No. 873,811. Divided and this application July 21, 1971, Ser. No. 164,543

Int. Cl. G01n *21/32*; B44d *1/18*

U.S. Cl. 117—218 **2 Claims**



An apparatus and a method for the detection of holidays in the wall of a coating on a curved elongated surface, such as that of an electrical conductor strand, employs light-transmitting fibers, distributed around the strand, to transmit both the illumination and the reflected light.

3,746,576

METHOD OF DEFOAMING OF SUGAR LIQUOR IN COUNTER-CURRENT CHIP-MIXERS

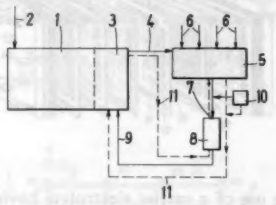
Ferdinand Schneider; Erich Reinefeld; Walter Dietzel, and Wilhelm Haberich, all of Braunschweig, Germany, assignors to Braunschweigische Machinenbauanstalt, Braunschweig, Germany

Filed Nov. 30, 1970, Ser. No. 93,536

Claims priority, application Germany, Dec. 2, 1969, P 19 60 341.9

Int. Cl. B01d *11/02*; C13d *1/12*

U.S. Cl. 127—45 **7 Claims**



A method of defoaming sugar juice in a countercurrent cossette mixers wherein the foam is removed from a mixer section of the cossette mixer to a let down device serving for the destruction of the foam and the juice which is freed from foam is sent back into the mixer section. The foam removal is performed by means of a juice-part-stream, the juice quantity of which is less than the raw-juice output. The foam feeding juice is distributed uniformly over the entire cross-section of the let down device and the juice part stream serving the foam removal is heated up about 5° to 10° C, so that simultaneously a partial sterilization of the sugar juice takes place in the mixer.

3,746,577

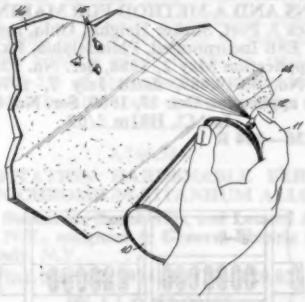
INSECT REMOVAL METHOD

Ralph L. Copeland, Bryan, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,013

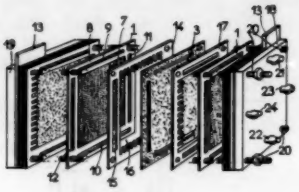
Int. Cl. B08b *7/00*

U.S. Cl. 134—4 **4 Claims**



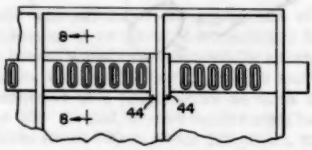
A method of applying a solvent for the removal of flying insects from automobile bodies, applied preferably by means of a pressure spray, the solvent consisting of the combination of sodium carboxymethyl cellulose and water.

3,746,578
FUEL CELL BATTERY
Bernard Warszawski, Paris, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom)
Filed Mar. 10, 1971, Ser. No. 123,110
Claims priority, application France, Feb. 24, 1967, 2,731, 2,732
Int. Cl. H01m 27/02
U.S. Cl. 136—86 R 21 Claims



To enable use of a carrier electrolyte having a reactant therein, fuel cell units may be stacked together, each fuel cell being formed of an embossed electrode having protuberances extending on at least one side, or possibly on alternate sides and separated from each other by semi-permeable diaphragms. In the case of a battery the electrodes are thin sheets held within a plastic frame, embossed to have the protuberances extending by several tenths mm., for example 0.5 mm., and the sides are preferably coated with catalysts. The marginal portions of the frames, the electrodes and diaphragms and spacer elements if used, are formed with openings to provide the stack with two electrolyte supply and drain systems. Opposite faces of the electrodes are in communication with alternate supply systems of electrolyte charged with reactant by fine ducts or microchannels, so that the electrolyte can wash over the faces of the electrodes. The electrolyte applied to one system includes a reducing agent, and to the other an oxidizing agent, to provide anodic and cathodic electrode surfaces, respectively, separated by permeable diaphragms. At least one of the additive agents may be a non-regeneratable material, soluble in the electrolyte. The additive agents may be also emulsified non-soluble gaseous or liquid material.

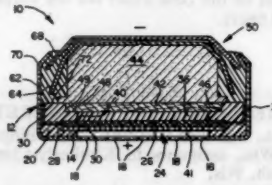
3,746,579
BATTERY HAVING CONTAINER IN TWO PORTIONS AND A METHOD FOR MAKING IT
Frederick J. Port, Shaker Heights, Ohio, assignor to ESB Incorporated, Philadelphia, Pa.
Original application May 2, 1968, Ser. No. 726,068, now Patent No. 3,519,489, dated July 7, 1970. Divided and this application Oct. 17, 1969, Ser. No. 871,207
Int. Cl. H01m 1/02
U.S. Cl. 136—134 R 7 Claims



A battery has a container consisting of an upper portion and a lower portion sealed together in any convenient manner. The cover may be separate from, or integrally constructed with, the upper portion of the container. Single cell or multicell as well as primary or secondary batteries may be so constructed.

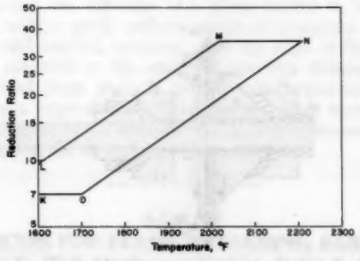
In multicell batteries the intercell strap connectors extend through the partitions of the cell compartments, preferably as molded inserts in the partitions. Preferably the ends of the intercell strap connectors are anchored by the container. Strap connectors may extend from end cells through the container as inserts molded therein to function as terminals.

3,746,580
GAS DEPOLARIZABLE GALVANIC CELL
Wesley E. Aker, Malvern, and Robert J. McCormick, Yardley, Pa., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Aug. 19, 1971, Ser. No. 173,067
Int. Cl. H01m 27/00
U.S. Cl. 136—86 A 9 Claims



A gas-depolarizable galvanic cell having an insert molded cathode subassembly is disclosed. The cathode subassembly has portions thereof formed of electrically nonconductive material and a portion thereof comprised of a gas-depolarizable electrode.

3,746,581
ZONE ANNEALING IN DISPERSION STRENGTHENED MATERIALS
Robert Lacock Cairns and John Stanwood Benjamin, Suffern, N.Y., assignors to The National Nickel Company, Inc., New York, N.Y.
Filed Jan. 31, 1972, Ser. No. 221,979
Int. Cl. C21d 1/26; B22f 3/24
U.S. Cl. 148—11.5 F 9 Claims



A method is provided for producing a hot worked high temperature heat resistant dispersion-strengthened superalloy, characterized by a metallographic structure consisting essentially of large coarse grains having a preferred orientation relative to the axis of working, the method comprising subjecting a dispersion-strengthened alloy, e.g., superalloy, to zone annealing at an elevated germinative

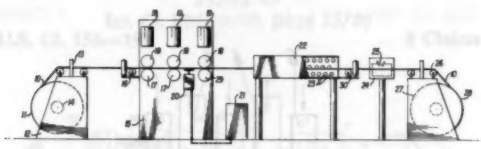
grain growth temperature to form coarse grains disposed in the working direction of the alloy and to achieve improved properties.

3,746,582

METHOD OF PRODUCING ANNEALED STRANDED CABLE

Bobby C. Gentry, Temple, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Aug. 26, 1971, Ser. No. 175,243
Int. Cl. C22f 1/00
U.S. Cl. 148—13 **16 Claims**



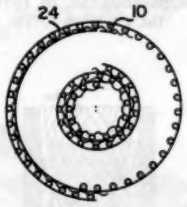
A method of continuously annealing stranded electrically conductive cable comprising the steps of passing unannealed stranded cable into an electrical resistance annealer, annealing the stranded cable, cooling the stranded cable and lubricating the stranded cable. Heat for annealing the cable is produced by electrical resistance between the contact rolls of the annealer and the cable. Annealing temperatures are controlled by varying the current to the contact rolls of the annealer.

3,746,583

METHOD OF MANUFACTURING ELECTRICAL CONTACTS

Ernest E. Siegfriedt, Jr., Winchester, and Otis H. Bramhall, Lexington, Mass., assignors to TRW Inc., Cleveland, Ohio

Filed Oct. 27, 1971, Ser. No. 192,949
Int. Cl. C22f 1/00
U.S. Cl. 148—13 **2 Claims**



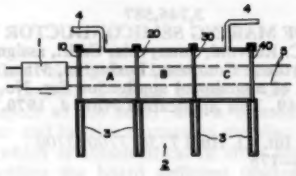
A method of manufacturing electrical contacts comprises: forming a plurality of contacts from a continuous sheet metal blank such that the individual contacts are spaced from each other, but remain connected to opposite longitudinal edge strips of the blank; reeling the contacts and edge strips into a coil form; and cleaning, hardening, surface treating, and coating the contacts while in the coil form, the coating being of a metal having superior electrical conductivity as compared with the base metal of the original blank. Additionally, the method may comprise: unreeling the first coil; cutting the edge strips at selected locations to provide strips of contacts of a desired length; reeling the strips into a plurality of smaller diameter coils and simultaneously interleaving a diverse metal separator between the loops of the smaller coils; and tin coating the tails of the contacts to render same readily solderable to wire leads.

3,746,584

METHOD FOR THE CONTINUOUS VACUUM DECARBONIZATION OF LOW CARBON FERROCHROME

Mutsuo Takeda, Takeji Nakajima, Kenji Takahata, and Toshitsugu Banba, Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1971, Ser. No. 113,981
Claims priority, application Japan, Feb. 18, 1970, 45/13,603
Int. Cl. C22c 1/06, 39/14
U.S. Cl. 148—13.1 **6 Claims**



Low carbon ferrochrome is manufactured by preheating in an evacuated preheating chamber particles of partially oxidized high carbon ferrochrome bonded together by a bonding agent for removing the bonding agent, decarbonizing the particles at an elevating temperature in an evacuated decarbonizing chamber and cooling the decarbonized particles in an evacuated cooling chamber to a temperature at which oxidation by the atmospheric air does not occur.

3,746,585

TITANIUM-BASE ALLOYS

Richard Ernest Goosey, Aldridge, England, assignor to Imperial Metal Industries, London, England

No Drawing. Continuation of abandoned application Ser. No. 836,625, June 25, 1969. This application Dec. 7, 1971, Ser. No. 205,728
Int. Cl. C22f 1/18; C22c 15/00
U.S. Cl. 148—32.5 **4 Claims**

Alloys of the titanium plus 1.5–3.5% copper type, suitable for strip and sheet manufacture, are given increased strength, without detriment to their other properties, by the addition of up to 5% in total from the group of 0.25–5% of aluminium, zirconium and tin and 0.1–1 silicon. The alloys are age-hardenable.

3,746,586

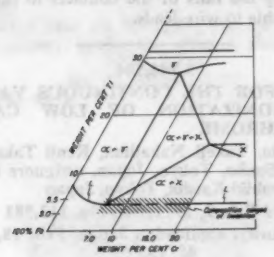
PRECIPITATION HARDENABLE FERRITIC IRON-CHROMIUM-TITANIUM ALLOYS

Edward R. Buchanan, Burnt Hills, and Lemuel A. Tarshis, Latham, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1971, Ser. No. 129,036
Int. Cl. C22c 39/14
U.S. Cl. 148—37 **5 Claims**

A range of high strength stainless steel alloy compositions, resistant to chloride stress corrosion cracking, and which contain essentially iron, from about 7.0 to about 20.0 wt. chromium, and an amount of titanium from a minimum corresponding to the limit of room temperature solid solubility of titanium in the iron-chromium

alloy up to about 5.5 wt. pct. These alloys can be solution treated and aged to provide a microstructure having



an alpha ferrite matrix containing a fine dispersion of second phase particles (chi or laves phase).

3,746,587

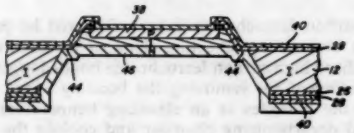
METHOD OF MAKING SEMICONDUCTOR DIODES

Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Continuation of abandoned application Ser. No. 795,977, Feb. 3, 1969. This application Nov. 4, 1970, Ser. No. 86,960

Int. Cl. H01l *7/36, 7/00, 3/00*

U.S. Cl. 148—175 **7 Claims**



A method of making a number of semiconductor diodes on a single wafer without breakage during handling and processing, comprising the steps of forming a plurality of mesas on one surface of an intrinsic substrate, diffusing a selected first conductivity-type region into each mesa, coating the front surface of the substrate and mesas with oxide, chemically milling recesses into the opposite side of the substrate in alignment with the mesas to a predetermined depth where the mesas are each supported by a thin annular area of substrate material permitting transfer of the device into an epitaxial reactor, gas etching the recesses to a depth beyond the oxide interface to physically separate the mesas from the substrate material, growing a thin epitaxial layer of opposite conductivity type over the back surface of the device, applying ohmic contacts to the device, and separating the individual mesas.

ERRATUM

For Class 148—23 see:
Patent No. 3,746,620

3,746,588

STERILIZATION OF NITROPARAFFIN-AMINE EXPLOSIVES

Niekolas Brunetz, La Mirada, and Robert A. Haskell, Long Beach, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,245

Int. Cl. C06b *7/00*

U.S. Cl. 149—89 **2 Claims**

A process for sterilizing an amine sensitized liquid explosive of the nitroparaffin type which process comprises adding to the sensitized explosive a sterilizing agent, for example, polycarbonate, diphenyl ester of carbonic acid, furaldehyde, 2,5-dimethyl 2,4-hexadiene, tributoxyborine, tributylester of phosphoric acid, tetraethylborosilicate, benzaldehyde, 1-phenyl-1-propanone, hexanone, succinic anhydride, maleic anhydride or a combination thereof in an amount effective to render the explosive nondetonable.

3,746,589

METHOD OF MAKING BUBBLE-FREE, FIBER REINFORCED PLASTIC LAMINATES BY TAMPING OPERATIONS

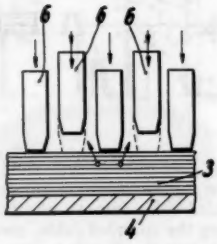
Fritz Reinke, Neckarstrasse 55, Erbach, Germany

Filed Nov. 3, 1970, Ser. No. 86,510

Claims priority, application Germany, Nov. 7, 1969, P 19 56 134.3

Int. Cl. B29c *27/04;* **B28b** *1/08*

U.S. Cl. 156—73 **7 Claims**



Method and apparatus for making articles, such as building components, by tamping a layer of fibrous material into a layer of liquid plastic material. The tamping is performed by directing blows on the layers in adjacent areas arranged like a grid, whilst the layers are moved relative to the areas. The amplitude of the blows within the individual areas decreases from a region of maximum amplitude towards the place where the layers leave the area.

3,746,590

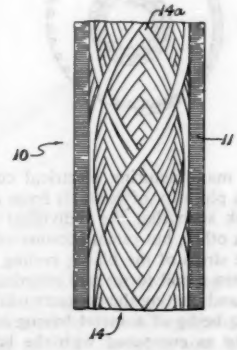
METHOD OF MAKING A PNEUMATIC TIRE HAVING A BELT WOUND FROM A TAPE

Donald R. Bartley, Cuyahoga Falls, and James Sidles, West Richfield, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 693,993, Dec. 27, 1967, Pat. No. 3,550,667. This application Oct. 26, 1970, Ser. No. 83,748

Int. Cl. B29h *17/10*

U.S. Cl. 156—117 **2 Claims**



A method of making a tire of the type having radially disposed reinforcing cords in the carcass and a restrictive belt

or girdle superposed thereon, characterized by the belt or girdle being formed as a circumferentially continuously wound strip of parallel cords disposed in a plurality of sinusoidal windings alternately tangent to opposite axial edges of the belt.

3,746,591

METHOD OF MAKING A SEMI-PERMEABLE MEMBRANE TUBE

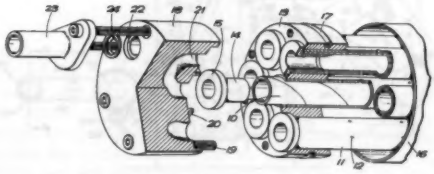
David Leslie Banfield, Whitchurch, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed July 14, 1970, Ser. No. 54,800

Claims priority, application Great Britain, July 16, 1969, 35,851/69

Int. Cl. B31c *9/00*; B01d *25/20*

U.S. Cl. 156—191 8 Claims



In the production of semi-permeable membrane assemblies one or more porous fibrous tapes are spirally wound into a tube and the membrane is provided as the inner or outer ply during or after winding. During winding at least one tape is overlapped on itself by up to 25% of its width and the overlapped portions are sealed.

3,746,592

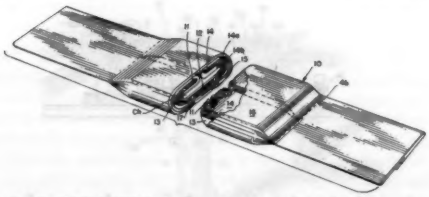
METHOD OF PRODUCING SANITARY NAPKINS

Ernst Daniel Nystrand and Brian H. McIntosh, Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Original application Apr. 28, 1970, Ser. No. 32,560, now Patent No. 3,667,468. Divided and this application Dec. 29, 1971, Ser. No. 213,768

Int. Cl. B32b *7/00*

U.S. Cl. 156—202 4 Claims



A sanitary napkin which has a fluff layer sandwiched between carrier layers, the sandwich being C-folded to provide a lined channel on one side of the sandwich which encourages more even, rapid, and complete dispersion of body fluids. By arranging the various elements of the apparatus for producing the napkin in a predetermined way, it is possible to alternatively produce diaper inserts.

3,746,593

MANUFACTURE OF BOXES FROM CORRUGATED BOARD AND LIKE MATERIALS

Zbigniew Jan Majewski, North Blawyn, Victoria, Australia, assignor to Australian Paper Manufacturers Limited, Melbourne, Victoria, Australia

Filed Sept. 10, 1968, Ser. No. 758,854

Claims priority, application Australia, Sept. 14, 1967, 27,210/67

Int. Cl. B31f *1/08*

U.S. Cl. 156—207 20 Claims

A method of forming foldable creases in corrugated board by forming a single crease in the "outer" liner (with respect to the fold) and a creased zone in the inner liner and interior corrugated member so as to form a hinge which is asymmetrical in cross section whereby during folding the board sufficient inward deformation of the inner liner and corrugated member occurs to prevent outward bulging of the inner liner and permit effective bending of the outer liner while minimizing any tendency to crack, the liners remaining flat and parallel up to a zone adjacent the crease and creased zone, even if the folding operation occurs through 180°.

3,746,594

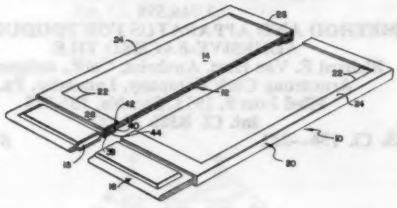
METHOD OF MANUFACTURING PHOTOGRAPHIC FILM UNIT

Albert J. Bachelder, Lexington, and Frederick J. Binda, Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Original application July 15, 1968, Ser. No. 744,912, now Patent No. 3,652,281. Divided and this application Feb. 11, 1971, Ser. No. 114,701

Int. Cl. G03c *5/54*

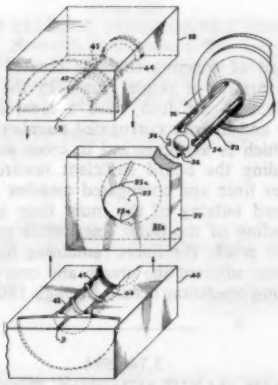
U.S. Cl. 156—216 8 Claims



A self-developing, photosensitive film unit including a multilayer photosensitive element and a transparent image-recording element laminated to one another during manufacture and a rupturable container of processing liquid attached to the elements at one end for dispensing its liquid contents between the elements, and adapted to be processed by passing the film unit including the container and laminated elements between a pair of pressure-applying members. The film unit is formed by embossing,

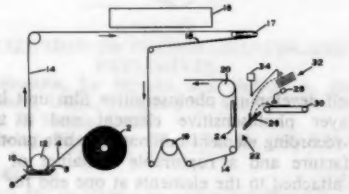
or attaching spacer strips, to the lateral margins of an elongated strip and then laminating the strip to a second strip by spreading a film-forming agent between the strips, severing the laminated strips to the required length to form sandwiches each comprising laminated photosensitive and image-recording elements, securing a binding around at least two sides of each sandwich and attaching a container of processing liquid to one end of the sandwich.

3,746,595
METHOD OF MAKING A SELF-SUPPORTING FILTER WITH POSITIONING OF A TUBULAR SLEEVE IN A MOLD
Hayden Leason, Hebron, Ill., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Sept. 29, 1971, Ser. No. 184,689
Int. Cl. B29d *23/00*; C09j *5/10*
U.S. Cl. 156—245 **2 Claims**



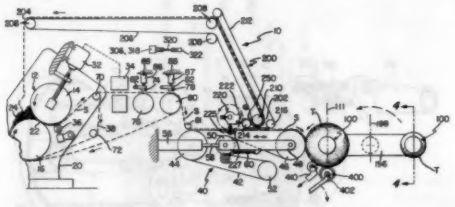
A self-supporting filter element is formed by heat-sealing longitudinal edges of woven filter material to seam together a tubular sleeve. The sleeve is placed over a male mold core having a channel precisely aligned with the seam. The male core is enclosed by a female mold cavity having a groove also aligned with the sleeve seam. Plastic is then injected into the channels to form not only a supporting rib but a reinforcement of the filter sleeve at the seam.

3,746,596
METHOD AND APPARATUS FOR PRODUCING ADHESIVE-BACKED TILE
Richard E. Van Hart, Anaheim, Calif., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed June 9, 1971, Ser. No. 151,348
Int. Cl. B32b *31/00*
U.S. Cl. 156—251 **5 Claims**



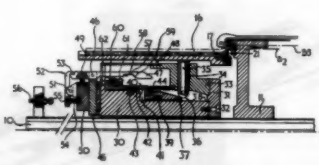
The process involves the unwinding of a roll of paper and coating it with an adhesive which is subsequently dried. The paper is then passed through an open press and is joined to a tile which is held by one platen of the press in the center of a rule die on the platen. The press closes and permits the rule die to cut a blank of paper from the roll of paper and, at the same time, press the blank of paper against the tile. Subsequent removal of the paper will leave the adhesive coating on the tile and permit the tile to adhere to any desired surface. The apparatus herein carries out the above process.

3,746,597
TIRE BUILDING MACHINE AND METHOD
Paul E. Appleby and Edwin S. Woodhall, Cuyahoga Falls, and Christopher E. Christie, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed June 11, 1969, Ser. No. 832,164
Int. Cl. B29h *17/37*
U.S. Cl. 156—396 **6 Claims**



A mill for forming a thin sheet of a curable elastomer and a tire carcass receiving drum are combined in apparatus including a conveyor spaced from the mill and engageable with a tire carcass on the drum so as to rotate the drum and wind thereon a continuous plurality of convolutions of the sheet. Slitters located in a space traversed by the sheet between the mill and the conveyor and controlled by a profiling device to be movable in timed relation to the rotation of the carcass vary the width or widths of the sheet portion applied while a second conveyor diverts remaining portions of the sheet from the first conveyor for return to the mill.

3,746,598
MANUFACTURE OF PNEUMATIC TYRES
Noel Nebout, Montlucon, France, assignor to Dunlop Limited, London, England
Filed Mar. 22, 1971, Ser. No. 126,546
Claims priority, application France, Mar. 24, 1970, 7010538
Int. Cl. B29h *17/22*
U.S. Cl. 156—400 **7 Claims**



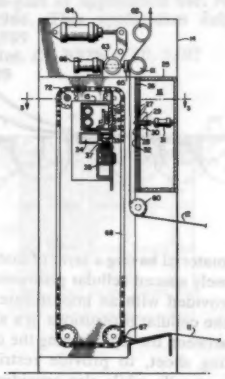
A method and apparatus for manufacture of a pneumatic tyre. A carcass is positioned on a drum with the beads laterally adjacent the drum and a reinforcing strip for the tyre is arranged on an annular surface which is expansible and has a profile complementary to the part of the bead nearest the drum and drum axis. The annular surface is brought up to the drum to be opposite the bead, the surface having a diameter less than the bead, and then expanded to bring the strip into contact with the bead.

3,746,599

BUTT SPLICER FOR BUTT-JOINING A FRESH WEB TO A RUNNING WEB

Emiel Adriaan Peeters, Gravenwezel, and Willy Lodewijk Pauwels, Schelle, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Jan. 28, 1971, Ser. No. 110,483
Claims priority, application Great Britain, Jan. 29, 1970, 4,374/70
Int. Cl. B31f *5/06*; G03d *15/04*
U.S. Cl. 156—505 13 Claims



A butt splicer for butt-joining a new web to a progressing web which permits to join both webs without any risk for edge-overlapping.

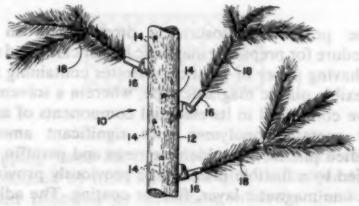
The splicer comprises a stationary and a displaceable clamping head for clamping the webs together preparatory to splicing, a cutter for simultaneously cutting both webs transversely while they are pressed together by the clamping heads, a tape applicator for taping the webs together at one side after the cut-off end of the web at that side has been removed, and a bar extending transversely of the web path and displaceable through the clamping plane, within the clamping zone, to cause localized bowing of one web and consequent displacement of its cut end away from the cut end of the other web before such web ends are taped together.

3,746,600

HINGED PLUG-IN BRANCH ATTACHMENT

Peter A. Circelli, Delmar, N.Y., assignor to American Technical Industries, Inc., Mount Vernon, N.Y.

Filed Sept. 23, 1971, Ser. No. 182,966
Int. Cl. A47g *33/06*
U.S. Cl. 161—14 6 Claims



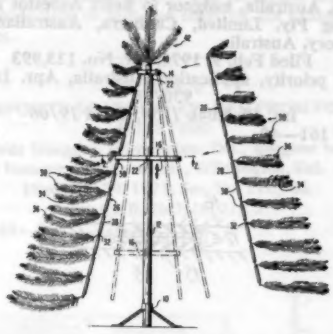
A knock-down artificial Christmas tree includes a trunk portion having a plurality of downwardly and inwardly extending openings arranged about its periphery. Each hole receives a plug-in branch holder, which in turn includes a pin adapted for insertion into the opening, an arcuate plate connected to and forming an acute angle with that pin, and a tubular branch holder hingedly secured to the arcuate plate. The resulting artificial tree prevents undesired movement of the assembled branches, and also renders imperceptible the manner in which the branches are attached to the trunk.

3,746,601

ARTIFICIAL SHRUB SUITABLE FOR INDOOR OR OUTDOOR USE

Gloria L. Strony, Peckville, Pa., assignor to Masterpiece, Inc., Blakely, Pa.

Filed May 20, 1971, Ser. No. 145,360
Int. Cl. A41g *1/00, 33/04*; A41f *5/10*
U.S. Cl. 161—24 6 Claims



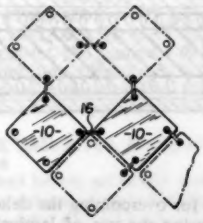
A vertically extending rod-like trunk member carries near its upper end in concentric fashion a thin snap ring while spaced downwardly from the same the trunk member carries a second snap ring of larger diameter. The peripheries of the snap rings are notched, and limb assemblies consisting of a generally straight main limb and cross limbs extending outwardly therefrom are snapped into frictionally clamped position within aligned notches at spaced locations along the main limb whereby the limb assemblies complete a conically configured artificial shrub.

3,746,602

DISC-LIKE PLATELET FABRIC

Alberto Caroli, Via Montessori 1, and Giovanni Giuffrida, % Officio Brevetti Dott. Prof. F. Cildgna and C. Via Visconte di Modrone 14/A, both of Milan, Italy

Filed June 10, 1971, Ser. No. 151,799
Int. Cl. B32b *3/10, 3/14*
U.S. Cl. 161—37 5 Claims



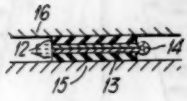
A fabric is described that can be used for decorative curtains or wall hangings, clothing for children and dolls, and the like. The fabric is formed by releasably coupling together a multiplicity of platelets and are preferably of a laminated plastic having some regular geometric shape. Each platelet is perforated adjacent its periphery to enable

connecting links to be inserted therethrough for releasably joining the platelets together to form the fabric. These connecting links are also preferably of plastic and usually have an enlarged end section which can be resiliently deformable to allow passage of the same through the perforations in the platelet and thus connect the platelets releasably together. Such connecting links allow easy and rapid repairs to be made to broken or damaged platelets, as well as enabling various patterns to be designed into the fabric by rearranging the platelets according to shape and colouring.

3,746,603
SLIP-JOINT CONSTRUCTION

Anthony Reginald George Hewett, Eastwood, New South Wales, Australia, assignor to Bell's Asbestos and Engineering Pty. Limited, Canberra, Australian Capital Territory, Australia

Filed Feb. 9, 1971, Ser. No. 113,993
Claims priority, application Australia, Apr. 16, 1970, 930/70
Int. Cl. E04b *1/54*; E01d *19/06*
U.S. Cl. 161—40 **2 Claims**

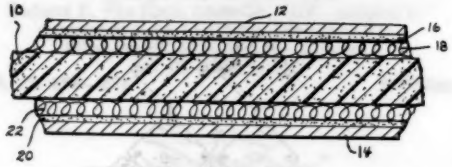


A slip-joint element for employment in a building or similar structure to accommodate differential expansion or movement between members of the structure. The slip-joint element comprises a laminate structure having a water impervious, resilient support material faced with a material having a co-efficient of friction which decreases with increasing applied load. The laminate structure is adapted to be employed in face-to-face sliding relationship with another such laminate structure, or is foldable upon itself for face-to-face contact, between relatively moveable load and load support members.

3,746,604
FOAMED PLASTIC LAMINATE AND METHOD OF MAKING SAME

Alex J. Reynolds, 5 Center Terrace, New Hartford, N.Y. 13413

Filed May 21, 1971, Ser. No. 145,654
Int. Cl. B32b *3/18, 3/26, 5/20*
U.S. Cl. 161—69 **4 Claims**

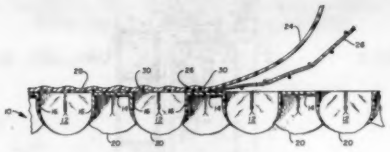


A technique for overcoming the delamination problems encountered during the use of laminated structures having a foamed plastic core. The natural adhesiveness existing between outer panel members and the foamed plastic inner core is enhanced by adhesively affixing a thin, continuous, convoluted ribbon of plastic to the interior surfaces of the outer panel members. The ribbon is affixed prior to the foaming reaction which produces the foamed inner core with the result that the core material bonds to the ribbon of plastic and the interior surfaces of the panel members to form an interlocking unitary structure.

3,746,605
CUSHIONING MATERIAL

Brian D. Dillon, and Robert L. Long, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,179
Int. Cl. B32b *3/12*
U.S. Cl. 161—122 **6 Claims**

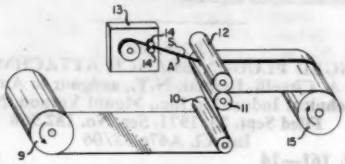


Cushioning material having a layer of material formed into a plurality of closely spaced cellular protrusions extending from one side, is provided with an imperforate backing sheet on open sides of the cellular protrusions. An air permeable sheet is interposed between the layer having the cellular protrusions and the backing sheet, to provide restrictive air passages between adjacent cells, while also providing for spaced areas of connection between the layer having the cellular protrusions and the backing sheet.

3,746,606
OFF-LINE PROCESS FOR LAMINATING MAGNETIC TAPE TO TAB STOCK

William P. Chao, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Continuation of Ser. No. 857,720, Sept. 15, 1969, abandoned. This application June 17, 1971, Ser. No. 154,222
Int. Cl. B32b *27/10, 27/28*; G11b *5/80*
U.S. Cl. 161—251 **4 Claims**



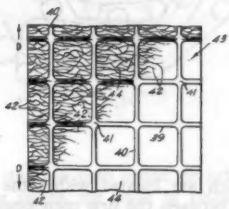
The present disclosure is directed to an "off-line" procedure for preparing magnetic ledger cards and similar articles having paper or plastic substrates containing thin stripes of flexible plastic magnetic tape, wherein a solvent-based adhesive comprised in its essential components of an ethylene-vinyl acetate copolymer with significant amounts of a modified phenol-formaldehyde resin and paraffin wax is first applied to a flexible plastic tape previously provided with at least one magnetic layer, film or coating. The adhesive solution is then dried to remove the solvent whereupon the tape can be stored for extended periods of time due to its non-tacky, non-blocking nature at ambient and elevated storage conditions of temperature and humidity. The adhesive is non-blocking at temperatures as high as 130° F. At any desired time thereafter, the thus adhesively coated magnetic tape can be laminated to a paper or suitable ledger or tab stock substrate by the use of heat without requiring any additional, i.e.,

extraneous, adhesive. The term "off-line" designates that the adhesive is applied before and frequently in a different location from that in which lamination of the paper base and magnetic tape occurs.

3,746,607
SHEET MATERIAL

Carlyle Harmon, Scotch Plains, N.J., and William Sibbach, Longmeadow, Mass., assignors to Johnson & Johnson

Continuation-in-part of application Ser. No. 595,152, Nov. 17, 1966. This application July 7, 1970, Ser. No. 52,989
Int. Cl. B32b *3/10, 5/02*
U.S. Cl. 161—109 **7 Claims**

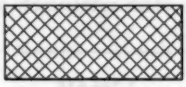


A tear resistant sheet material having a soft, fibrous hand. The sheet material has a predetermined pattern of film areas of crystalline, orientable polymer. These film areas are interconnected by fibrous areas of substantially the same polymer and these film areas are substantially thicker than the fibrous areas. The fibrous areas have a multiplicity of fine fibers uniformly distributed throughout the area.

3,746,608
SHAPED ARTICLE OF SYNTHETIC RESIN HAVING MECHANICALLY DISORDERED ORIENTATION

Mitsuhiro Takahashi, Fukushima-ken, Japan, assignor to Nitto Boseki Co., Ltd., Fukushima-shi, Japan

Application May 26, 1969, Ser. No. 834,582, which is a continuation of abandoned application Ser. No. 366,244, May 11, 1964. Divided and this application Sept. 17, 1971, Ser. No. 181,304
Claims priority, application Japan, May 14, 1963, 38/24,051
Int. Cl. B32b *3/00*
U.S. Cl. 161—116 **4 Claims**



A strapping band having improved resistance to splitting is produced by melt extrusion of a thermoplastic synthetic resin followed by stretching whereby the band is oriented in the longitudinal direction and given strength in that direction, followed by subjecting thus oriented band to compression by rollers having indentations on their surface to form a multitude of indentations throughout the surface of the band, whereby the orientation is partially disordered and the strength of the band in the axis perpendicular to the extrusion axis is greatly improved.

3,746,609
LAMINATE OF SMA COPOLYMER AND POLYAMIDE

Karl Stange, Hambach, Helmut Jenne, Schriesheim, Hans-Peter Weiss, Altrip, and Ulrich Koenig, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

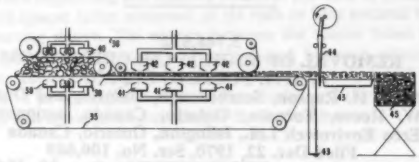
No Drawing. Filed Oct. 4, 1971, Ser. No. 186,422
Claims priority, application Germany, Oct. 8, 1970, P 20 49 380.5
Int. Cl. B32b *27/34, 27/32, 27/30, 27/08;* **C08g** *41/04*
U.S. Cl. 161—165 **4 Claims**

Laminates of a styrene polymer A and a polyamide B, the styrene polymer A being a copolymer of styrene and the anhydride of an ethylenically unsaturated dicarboxylic acid which may if desired have been modified with a butadiene or acrylic ester polymer. The laminates are suitable for the production of film and sheeting, for example packaging film.

3,746,610
COMPOSITE BOARDS PREPARED FROM FOAM SHEETING

Erhard Fritz Hoegger, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1971, Ser. No. 110,962
Int. Cl. B32b *5/16, 21/02*
U.S. Cl. 161—168 **9 Claims**



A composite board prepared by reducing foam sheeting into flakes, collecting the flakes and arranging them in batt form, heating the batt to a temperature sufficient to render the flake surface tacky, compressing the hot batt to the desired thickness and cooling the compressed batt to a temperature sufficient to bond the flake surfaces, thereby forming a composite board. Optionally, the flakes can be coated with an adhesive before they are distributed into batt form and the adhesive on the surface of the flakes in the batt heated to the tack temperature of the adhesive rather than the tack temperature of the foam. This composite board can be formed from waste foam sheeting and is particularly useful as a shock insulator in packaging.

3,746,611
SILYL ACYL PEROXIDE AND ACYL PEROXY POLYSILOXANE BINDERS

John R. Joy, Stevenson, Md., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Oct. 21, 1970, Ser. No. 82,817. Divided and this application Aug. 12, 1971, Ser. No. 171,357
Int. Cl. B32b *13/04, 13/12, 17/06*
U.S. Cl. 161—206 **1 Claim**

There is described herein an article comprising at least two solid surfaces joined at their interface by the condensation products of a silyl acyl peroxy compound containing at least one of the following structures:

$$\left[Z_{3-x}SiR'-\left(\left(\begin{matrix}H\\|\\N\end{matrix}\right)_y-\begin{matrix}O\\\|\\C\end{matrix}-O\right)_z\left(OR''\right)_{z-a} \right]$$

$$O_{\frac{x}{2}}$$

wherein R' is an alkylene, aralkylene or alkarylalkylene radical, R'' is an alkyl or aralkyl radical, Z is a monovalent hydrolyzable radical or monovalent organic radical bonded to the silicon atom by a carbon to silicon bond and wherein x is an integer from 0 to 3 inclusive, and provided that when x is greater than zero the oxygen atom is in turn bonded to another silicon whereby to form a siloxane, wherein said siloxane and any remaining siloxane units in said siloxane composition are of the formula;

$$Z'_wSiO_{\frac{4-w}{2}}$$

wherein Z' is Z or

$$R'\left(\begin{matrix}H\\|\\N\end{matrix}\right)_y\begin{matrix}O\\\|\\COOR''\end{matrix}$$

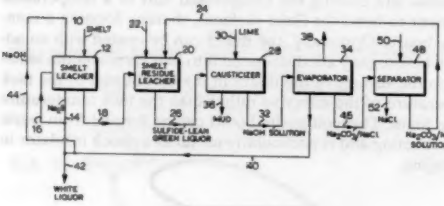
wherein Z, R', R'' and y are as herein defined and w is 1 to 3 inclusive; y is 0 to 1, and z is 1 or 2; with the proviso that when y is 0, the acylcarbonylcarbon is bonded to R', the R' having at least 2 sequential carbon atoms separating the acyl carbonyl carbon atom from the silicon atom; with the further proviso that when y is 1, z is 1 and the nitrogen atom is bonded to a carbon atom of R', the R' having at least 3 sequential carbon atoms separating the nitrogen from the silicon atom wherein one solid surface is an inorganic oxide and the other solid surface is a polymer.

3,746,612

REMOVAL OF SODIUM CHLORIDE FROM WHITE PULPING LIQUOR

William H. Rapson, Scarborough, Ontario, and Douglas W. Reeve, Toronto, Ontario, Canada, assignors to Erco Envirotech Ltd., Islington, Ontario, Canada

Filed Dec. 22, 1970, Ser. No. 100,669
Claims priority, application Canada, Dec. 30, 1969, 63,172
Int. Cl. D21c *11/12*
U.S. Cl. 162—17 **27 Claims**



A white liquor for a pulping process having a reduced sodium chloride-content is prepared by subjecting dilute white liquor to concentration to deposit sodium chloride therefrom.

3,746,613

TWIN WIRE PAPER MAKING MACHINE WHEREIN THE WIRES TRAVEL IN AN ARC

Esko Vauhkonen, Syrjalankatu 9 A 195, Jyvaskyla, Finland

Filed Feb. 11, 1971, Ser. No. 114,639
Int. Cl. D21f *1/00*
U.S. Cl. 162—301 **6 Claims**

A paper making machine has a forming section provided with two endless wires forming a narrowing zone for the formation of paper web from pulp slurry fed into the zone. Parts of wires facing each other are urged against the paper web located between them by the use of table rolls. The invention is particularly characterized by the arrangement of the table rolls within one of the endless wire loops such that a line connecting their axes forms an imaginary arc of a cylindrical surface. Other

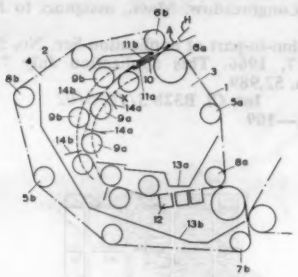


table rolls which are located within the second closed wire loop and between the first mentioned table rolls in such manner that their periphery penetrates by a given distance into the space beyond the outer tangential plane of the first-mentioned table rolls to produce a serpentine-like path of travel for the paper web in addition to moving in an arc.

3,746,614

METHOD FOR DETECTING AND LOCATING FAILED SODIUM-BONDED FUEL ELEMENTS

Robert J. Meyer, Westmont, Carl E. Johnson, Elk Grove, and Carl E. Crouthamel, Glen Ellyn, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 29, 1972, Ser. No. 293,724
Int. Cl. C27c *17/14*
U.S. Cl. 176—19 LD **9 Claims**

This invention is a method for detecting and locating failed sodium-bonded fuel elements in a liquid-sodium-cooled nuclear reactor. A mixture of any two of the three staple isotopes ^{197}Au, ^{121}Sb and ^{198}Pt is dissolved in the sodium bonding in each of a plurality of unirradiated sodium-bonded fuel elements. The fuel elements within each subassembly or group of fuel elements contain an isotopic mixture of the same predetermined weight ratio of the two selected isotopes. Gamma-spectrometric assay of the primary sodium coolant will detect the isotopes' activation products released into the coolant by a fuel element failure and determine the activity ratio thereof to indicate which subassembly contains the failed fuel element.

3,746,615

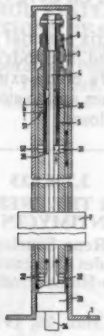
DRIVING DEVICE FOR REGULATOR RODS OF NUCLEAR REACTORS

Hans Rottger and Hans-Peter Schabert, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 1, 1970, Ser. No. 77,213
Claims priority, application Germany, Oct. 11, 1969, P 19 51 418.2
Int. Cl. C21c *7/12*
U.S. Cl. 176—36 R **4 Claims**

A device for driving the regulator rods of fluid-cooled nuclear reactors comprises a tubular drive rod from which a regulator rod is suspended. The drive rod is operatively linked with a motion control mechanism, such as a mag-

netic jack. The tubular wall of the drive rod has openings axially spaced from each other to jointly define a coolant flow path lengthwise through the tubular drive rod. A displaceable shut-off member, preferably a tubular slider,



normally closes the flow path inside the tubular drive rod and temporarily opens the path in response to forces exerted by the coolant when the tubular drive rod rapidly travels downward.

3,746,616

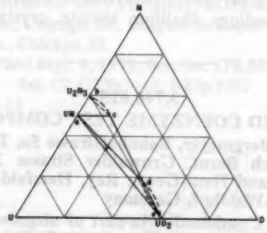
STABILIZED URANIUM OR URANIUM-PLUTONIUM NITRIDE FUEL

James M. Leitnaker, Kingston, and Karl E. Spear II, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Original application Dec. 23, 1969, Ser. No. 887,696. Divided and this application July 20, 1971, Ser. No. 164,430

Int. Cl. G21c 3/06

U.S. Cl. 176—67 3 Claims



A high temperature fuel is provided comprising an oxygen-containing uranium or uranium-plutonium mononitride which forms a separate U-O-N phase under reactor service conditions, wherein the nitrogen equilibrium pressure is at least a factor of 20 less than that of the corresponding oxygen-free mononitride fuel. Stabilization of these fuels with respect to nitrogen release is achieved by incorporating an amount of oxygen in the fuel and reacting the fuel under reactor service conditions to thereby form the U-O-N phase which accommodates within the structure excess nitrogen as it is produced from fuel burnup.

3,746,617

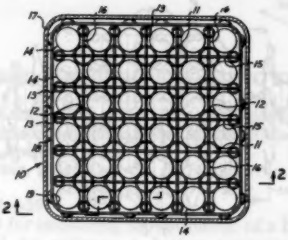
NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY

Kumiy Roy Iwao, Lafayette, and David Yee, San Leandro, both of Calif., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 1, 1970, Ser. No. 41,965

Int. Cl. G21c 3/34

U.S. Cl. 176—78 11 Claims



A nuclear reactor fuel element spacer arrangement having a fuel rods supporting and spacing means in the form of resilient slotted spacer tubes mounted on tie rods or bars secured to a supporting sleeve. The spaces between the spacer tubes are such that the fuel elements are gripped between adjacent spacer tubes or between spacer tubes and portions of the sleeve. The arrangement facilitates loading of the fuel elements and minimizes scratching of the fuel elements.

3,746,618

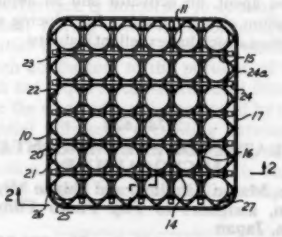
NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY

Susumu Nakazato, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 1, 1970, Ser. No. 41,967

Int. Cl. C21c 3/34

U.S. Cl. 176—78 8 Claims



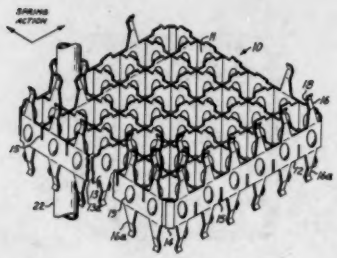
A nuclear reactor fuel element spacer arrangement having a fuel element supporting and spacing means in the form of spacer tubes mounted on tie rods or bars secured to a resilient supporting sleeve with the tie rods in tension. The spaces between the spacer tubes are such that the fuel elements are gripped between adjacent spacer tubes or between spacer tubes and portions of the sleeve. The arrangement facilitates loading of the fuel elements and minimizes scratching of the fuel elements.

3,746,619

NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY

Kumiy R. Iwao, Lafayette, Calif., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 1, 1970, Ser. No. 41,968
Int. Cl. G21c *3/34*
U.S. Cl. 176—78 3 Claims



A nuclear reactor fuel element spacer arrangement having a fuel rod supporting and spacing means in the form of individual cells through which respective fuel rods extend. The cells have a number of sides, some of which are provided with leaf spring members protruding above and below the cell and others of which are provide with knobs such that the fuel rod in each cell is resiliently gripped between the springs and the knobs in a manner to restrict lateral motion of the fuel rods.

3,746,620

WATER SOLUBLE FLUX COMPOSITION

Gary R. Vance, East Brunswick, N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed July 13, 1971, Ser. No. 162,302
Int. Cl. B23k *35/34*
U.S. Cl. 148—23 6 Claims

A water soluble flux composition has been prepared for treating metal surfaces, such as printed circuit boards and the like. The composition comprises butyl cellosolve, a nonionic surface active agent, an activator and an aliphatic alcohol. This composition also is capable of producing a heavy foam flux composition which has excellent stability.

3,746,621

PREPARATION OF ENZYME-CONTAINING MICROCAPSULE

Asaji Kondo, Masao Kitajima, and Shizuo Miyano, Asakishi, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 24, 1969, Ser. No. 836,066
Claims priority, application Japan, June 25, 1968, 43/44,099
Int. Cl. C07g *7/02*
U.S. Cl. 195—63 11 Claims

A method for making enzyme-containing microcapsules and the resulting product including forming a dispersion of an enzyme, a binder, a solvent for the binder, and a swellable solid which is insoluble in said solvent, and spray drying the dispersion at a temperature below that which the enzyme undergoes denaturation.

3,746,622

COMPOSITION AND PROCESS

A. Hirotoshi Nishikawa and Harry F. Hixson, Jr., Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

No Drawing. Filed May 12, 1971, Ser. No. 142,778
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R 8 Claims

A novel affinity matrix material for trypsin and trypsin-like enzymes is disclosed. Methods employing this material to isolate and/or purify crude extracts containing trypsin and trypsin-like enzymes and to store the purified enzymes obtained are also disclosed.

3,746,623

PROCESS FOR THE PREPARATION OF ANTIMYCIN A

Claude Vezina, Oka, Rene Saucier, Laval, and Surendra N. Sehgal, Dollard des Ormeaux, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 26, 1971, Ser. No. 128,523
Int. Cl. C12b *1/00*
U.S. Cl. 195—80 4 Claims

Improved process for the preparation of Antimycin A in which a suitable source of assimilable carbon is added during fermentation together with continuous control of pH at about pH 6.0, and an improved method of extraction is being used.

3,746,624

48-HOUR TEST FOR *STREPTOCOCCUS MUTANS* IN PLAQUE

Kirk C. Hoerman, Lake Bluff, Irving L. Shklair, Waukegan, James E. Klima, Great Lakes, and Lloyd G. Simonson, Waukegan, Ill., assignors to the United States of America as represented by the Secretary of the Navy

Filed Apr. 21, 1972, Ser. No. 246,291
Int. Cl. C12k *1/10*
U.S. Cl. 195—100 7 Claims

The invention disclosed herein relates to a 48-hour test for determining the presence of *Streptococcus mutans* whose occurrence is highly correlated to dental caries The organisms' presence may be determined thru an inexpensive and rapid procedure including a test solution of mannitol in sugar-free thioglycolate medium, a purple broth base medium, thallium acetate, crystal violet and sulfisomidine.

3,746,625

STABILIZED COENZYME TEST COMPOSITIONS

Hans Ulrich Bergmeyer, Bahnhofstrasse 5a, Tutzing, Germany; Erich Bernt, Gruwalder Strasse 34, Munich, Germany; and Hans-Georg Rey, Hersfelderstrasse 18, Mannheim-Waldhof, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 689,005, Dec. 8, 1967. This application Dec. 8, 1970, Ser. No. 96,243
Claims priority, application Germany, Dec. 12, 1966, B 90 26 942.1
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R 14 Claims

There are disclosed stabilized coenzyme test compositions which comprise reduced nicotinamide-adenine-dinucleotide and/or reduced nicotinamide-adenine-dinucleotide-phosphate in admixture with at least one SH-group-containing organic compound, such as for example, cysteine, glutathione, thioglycollates, N-acetyl-homocysteine, etc. The compositions are porous powders, soluble in water. They need only be brought into solution

and added to the material to be investigated for the analytical procedure to be carried out.

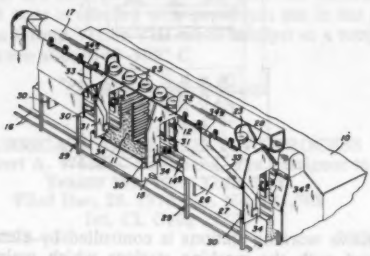
There are also disclosed the methods of making and using the compositions.

3,746,626

POLLUTION CONTROL SYSTEM FOR DISCHARGING OPERATIONS OF COKE OVEN

Joseph N. Morrison, Jr., Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1970, Ser. No. 37,120
Int. Cl. C10b *33/00*
U.S. Cl. 202—263 **7 Claims**



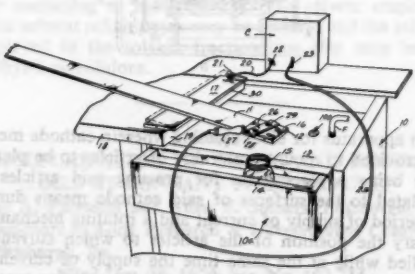
An apparatus and method is detailed for effecting pollution control for a coke oven battery during the coke removal operation, and the transporting of the coke to the next processing area. A canopy means is disposed over the area which contains the coke. An exhaust manifold and exhaust means associated therewith are adapted to be connected to the canopy means. A plurality of individually operable dampers are spaced along the travel path of the coke, and a damper control system is provided. The control system is actuated through predetermined dampers which are disposed to connect the exhaust manifold to the canopy means, with the rest of the dampers remaining closed. Substantially all the evolved pollutants are collected via the dampers and the exhaust manifold for processing.

3,746,627

METHOD OF METAL ELECTROPLATING

Felix R. Rapids, Chicago, Ill., assignor to Rapid Electroplating Process, Inc., Chicago, Ill.

Filed Sept. 9, 1971, Ser. No. 178,907
Int. Cl. C23b *5/48*; B23p *1/02*
U.S. Cl. 204—15 **3 Claims**



Electroplating a localized contact area on an electrically conductive portable member, such as a bus bar, cylindrical shafting or the like, while said member is removably resting in an electrically conductive but non-interengaged state on a current-carrying cathode bar that is electrically connected to a source of a plating current, and passing such plating current through said cathode bar to the member to be plated, while at the same time rubbing the contact area to be plated with a plating electrolyte-carrier to wet said area with the electrolyte and build up a plated layer thereon. The apparatus for use in carrying out the aforesaid method includes the movable cathode bar as an adjustable support affording not only a supporting, preferably edge contact, but also providing an inclinable surface for drainage thereover of electrolyte drippings into a sink or other receptacle.

3,746,628

METHOD FOR BORIDE COATING STEEL ELECTROLYTICALLY

Wesley G. Kannenberg and William E. Pruden, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Oct. 21, 1971, Ser. No. 191,516
Int. Cl. C23b *5/00*
U.S. Cl. 204—39 **6 Claims**

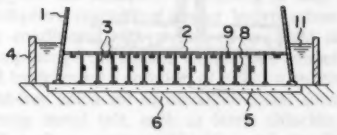
A method for improving the formation of a boride coating on steel by utilizing a higher temperature and a higher current density than heretofore whereby a faster diffusion rate is obtained and porosity eliminated.

3,746,629

METHOD OF PREVENTING CORROSION OF THE BOTTOM OF BLAST FURNACE IMMERSED IN COOLING WATER

Ryoji Nishikata and Toshio Fujieda, Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1970, Ser. No. 93,041
Claims priority, application Japan, Dec. 9, 1969, 44/98,518
Int. Cl. C23f *13/00*; C21b *7/10*
U.S. Cl. 204—148 **7 Claims**



In a blast furnace of the type wherein the steel or iron bottom of the furnace is immersed in cooling water, electrodes of metal having lower electrochemical (or electrode) potential than steel or iron are electrically connected through conductors to the portions of the furnace bottom which are required to be protected from corrosion so as to cause the electrodes to be corroded by utilizing the natural potential difference prevailing between the electrodes and the portions thereby protecting said portions against corrosion. The furnace bottom is supported by spaced supports which provide cooling water passages therebetween.

3,746,630

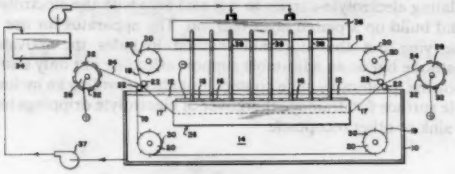
APPARATUS FOR SELECTIVE ELECTROPLATING OF STRIPS

Leo N. Kosowsky, Sharon, and Curtis N. Lovejoy, Walpole, Mass., and John G. Cunniff, Foster, and Robert T. Groom, Warwick, R.I., assignors to Auric Corporation, Newark, N.J.

Filed Dec. 8, 1970, Ser. No. 95,995
Int. Cl. C23b *5/68*; B32p *1/12*
U.S. Cl. 204—206 **15 Claims**

Apparatus for continuously electroplating pre-selected portions on the surface of continuously-moving metal

strips wherein the strips are carried through an agitated bath of electrolyte while biased between sealing webs



which have apertures allowing electrolyte to contact only the aforesaid pre-selected surface portions.

3,746,631

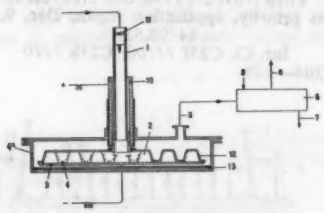
APPARATUS FOR THE ELECTROLYSIS OF ALKALI METAL CHLORIDE SOLUTIONS WITH MERCURY CATHODE

Franz Glos, Salzgitter-Lebenstedt, and Joachim Mischke, Dortmund-Hochsten, Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Original application Jan. 10, 1969, Ser. No. 790,337, now abandoned. Divided and this application Aug. 26, 1971, Ser. No. 175,066

Int. Cl. B01k *3/04;* C22d *1/04*

U.S. Cl. 204—219 2 Claims



An apparatus for the electrolysis of alkali metal chloride solutions with mercury cathode. Fresh brine is delivered through a hollow shaft and uniformly distributed to a plurality of passages in the anode. Small openings in the passages on the active side of the anode enable brine to pass into the narrow electrolysis gap between the anode and mercury cathode. Small openings in the solid part of the anode or between the passages enable the weakened brine charged with small chlorine gas bubbles to flow into the cell chamber.

3,746,632

APPARATUS FOR ELECTROCHEMICAL PROCESSING OF METALLIC WORKPIECES

Günther Kübdorf, Stuttgart, and Joachim Berndt, Stuttgart-Mohringen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

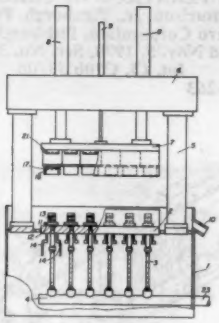
Filed Oct. 20, 1971, Ser. No. 190,945

Claims priority, application Germany, Oct. 21, 1970, P 20 51 710.6

Int. Cl. B23p *1/02*

U.S. Cl. 204—224 8 Claims

A plurality of working stations is provided, each having a working electrode on which a metallic workpiece is to be held in predetermined orientation. Passages are provided on each working station for conducting a liquid electrolyte into contact with the electrode and the workpiece. A source of supply supplies liquid electrolyte at a predetermined level of pressure to the passages of all of the working stations, and the outflow of used electrolyte from the



respective working stations is controlled by elements associated with the working stations which maintain the pressure substantially constant even if at one or more of the working stations a workpiece should be missing during operation of the other working stations.

3,746,633

APPARATUS FOR ELECTROPLATING WORKPIECES INCLUDING MEANS TO VARY THE POSITION OF THE WORKPIECES

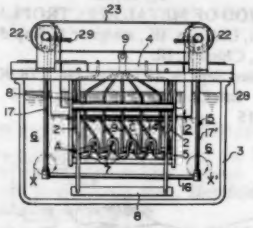
Akira Miyato, Hideyo Okubo, Chikayoshi Tomita, Akio Suzuki, and Hidenobu Ito, Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1971, Ser. No. 128,407

Claims priority, application Japan, Aug. 24, 1970, 45/73,631

Int. Cl. B01k *3/00*

U.S. Cl. 204—231 10 Claims



An apparatus for electroplating wherein cathode means are provided to mount a plurality of articles to be plated, there being a mechanism for pressing said articles to be plated to the surfaces of said cathode means during the period of supply of current and a rotating mechanism to vary the position of the articles to which current is supplied while at the same time the supply of current is stopped, the pressing mechanism and the rotating mechanism being connected to an interlocking mechanism so that the supply of current is stopped and the pressure of the pressing mechanism is released before activation of the rotating mechanism.

3,746,634

DEUTERATED LUBRICATING OILS

Joseph G. Atkinson, Montreal, Quebec, and Michael O. Luke, Beloeil, Quebec, Canada, assignors to Charles E. Frosst & Co., Kirkland, Quebec, Canada

Continuation-in-part of abandoned application Ser. No. 724,429, Apr. 26, 1968. This application Aug. 24, 1970, Ser. No. 66,657

Claims priority, application Canada, Apr. 29, 1967, 989,262; Aug. 4, 1970, 89,902

Int. Cl. C10g *41/00*

U.S. Cl. 208—18 6 Claims

Deuterated saturated acyclic and cyclic hydrocarbons having at least 10 carbon atoms, a melting point no greater than 300° C. and an isotopic purity of at least 95 atom percent D are described. Deuteration of the substrate in its liquid state is effected with deuterium gas in the presence of a Group VII or VIII metal catalyst at a temperature between about 100–300° C.

3,746,635

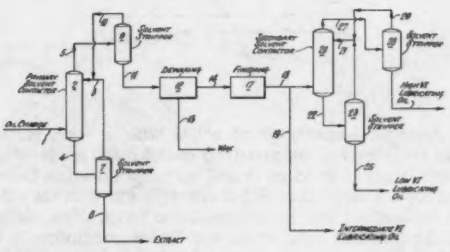
LUBRICATING OIL REFINING PROCESS

Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,708

Int. Cl. C10g *21/20*

U.S. Cl. 208—36 2 Claims



A process for the refining of lubricating oils by solvent extraction of a lubricating oil fraction from paraffin base crude to form an intermediate viscosity index lubricating oil stock, dewaxing the intermediate viscosity index lubricating oil stock and solvent fractionating the dewaxed stock to produce a high viscosity index lubricating oil stock and a low viscosity index lubricating oil stock. The intermediate viscosity index lubricating oil stock may be finished prior to solvent fractionation by acid treating, clay contacting or hydrotreating. The solvent employed in the solvent refining step may be furfural and the solvent employed in the solvent fractionation step may be N-methyl-2-pyrrolidone.

3,746,636

DESULFURIZATION OF CRUDE AND RESIDUAL OILS AT CONTANT TEMPERATURE

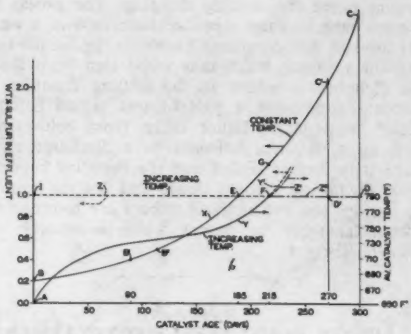
John A. Paraskos and Allen E. Somers, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 30, 1970, Ser. No. 102,716

Int. Cl. C10g *23/02*

U.S. Cl. 208—216 9 Claims

A process for hydrodesulfurizing a crude oil or a residual oil comprises passing the oil over a hydrodesulfurization catalyst to achieve a desired degree of sulfur in the effluent product. A substantially constant temperature with varying effluent sulfur level is maintained during the process such that more than the desired degree of sulfur removal is achieved during at least a portion of the duration of the process.



3,746,637

OXIDATIVE SWEETENING OF HYDROCARBONS WITH A CALCINED COGELLED PRECIPITATE OF IRON AND COPPER SALTS WITH SILICA SOL

Sun W. Chun, Murrysville, Harry A. Hamilton, Natrona Heights, and Angelo A. Montagna, Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed July 15, 1971, Ser. No. 163,056

Int. Cl. C10g *27/04*

U.S. Cl. 208—191 7 Claims

A process for the oxidative sweetening of sour hydrocarbons comprises contacting a sour hydrocarbon under sweetening conditions with a defined calcined cogelled catalyst comprising iron, silicon, oxygen and copper which is prepared by forming a solution of either a substantially alkali metal-free silica sol or an alkali-metal silicate sol, an iron group metal salt, such as ferric chloride, and a copper salt such as copper chloride, and cogelling the solution with, for example, ammonia, to form a precipitate which is then dried and calcined.

3,746,638

BATCH SEWAGE TREATMENT SYSTEM AND METHOD

Lee R. Gensman, Tualatin, and Jack R. Nunn, Portland, Oreg., assignors to Bio-Pure, Inc., Tualatin, Oreg.

Filed Mar. 3, 1971, Ser. No. 120,442

Int. Cl. C02c *1/06*

U.S. Cl. 210—7 9 Claims

A sewage treating system and method particularly suitable for installations with highly variable flow provides automatic operation in which incoming sewage is mixed and aerated continuously (or intermittently under low flow conditions) and withdrawn in batches for clarification and discharge. A sewage receiving basket having open mesh side and bottom walls is partly submerged in mixed liquor (mixed aerated sewage) in an aeration chamber. Mixed liquor is mixed with air utilizing venturi aspirated atmosphere into a pump suction and circulated in this chamber. A portion of the aerated mixed liquor is circulated through the basket to cause aerobic digesting and hydraulic erosion such that there is a reduction in

size of the solid organic material in the basket to particles which will pass through openings in the walls of the basket and intermix with pre-existing mixed liquor. Batches of mixed liquor are intermittently pumped from this chamber into a settling chamber in excess of the amount filling the settling chamber. The excess is discharged back into the aeration chamber over a weir and acts to skim floating sludge back into the aeration chamber. The resulting batch thus withdrawn from the aeration chamber is settled in the settling chamber under quiescent conditions; a part of this settled batch, specifically supernatant liquor taken from below the top scum layer, is then delivered to a discharge chamber where it is further settled and the resulting supernatant liquor discharged. Settled sludge and floating scum from the settling and discharge chambers are returned to the aeration chamber by pumps which completely empty these chambers.

3,746,639

PHENOL PLANT EFFLUENT TREATMENT

Thomas Bewley, Epsom, and Maurice Dudley Cooke, East Horsley, England, and Max Marin Wirth, Culross, Scotland, assignors to BP Chemicals Limited, London, England

No Drawing. Filed June 25, 1971, Ser. No. 156,875

Claims priority, application Great Britain, July 6, 1970, 32,636/70

Int. Cl. C02c *5/02*

U.S. Cl. 210—18 **5 Claims**

A process for improving the biodegradability of a phenol plant effluent stream by decomposing or chemically modifying certain biocides contained therein.

3,746,640

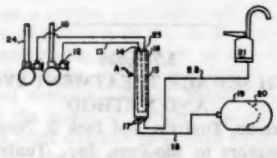
WATER PURIFICATION SYSTEM FOR SMALL REVERSE OSMOSIS UNIT WITH INTEGRAL BLOWDOWN WATER DISPOSAL

Donald T. Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Filed Feb. 17, 1971, Ser. No. 116,109

Int. Cl. B01d *31/00, 13/00*

U.S. Cl. 210—23 **9 Claims**



The supply water inlet connection of a conventional reverse osmosis water purifying unit is connected to a pressurized water supply pipe, and the blowdown water connection of the unit is connected to a pressurized enclosure having, when stabilized, a pressure equal to that of the water supply pipe, such as another water supply pipe or a pressurized vessel. The unit is free from flow restriction between its inlet water and blowdown connections, and when pressure is lowered relatively, either in the pressurized supply pipe or the pressurized enclosure, a blowdown surge occurs toward the lowered side and through the unit between the inlet connection and the blowdown connection. Successive surges dispose of sufficient blowdown water, either to the inlet pipe or to the pressurized enclosure to make the system operative without other waste disposal facilities, and without noticeably contaminating the water in the pipe or pipes into which the saline waste water is thus discharged.

3,746,641

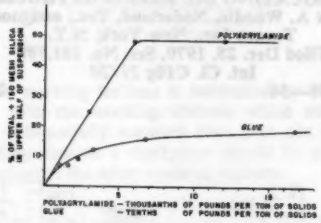
METHOD OF MAINTAINING AQUEOUS SUSPENSION OF FLUIDIZED SOLIDS IN COOLING SYSTEM

Robert Ben Booth, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 179,287, Mar. 7, 1962, which is a continuation-in-part of application Ser. No. 698,429, Nov. 25, 1957. This application July 27, 1970, Ser. No. 58,338

Int. Cl. C02b *5/06*

U.S. Cl. 210—58 **1 Claim**


POLYACRYLAMIDE
GLUE
% OF TOTAL + 150 MESH SILICA IN UPPER HALF OF SUSPENSION
POLYACRYLAMIDE — THOUSANDTHS OF POUNDS PER TON OF SOLIDS
GLUE — TENTHS OF POUNDS PER TON OF SOLIDS

Aqueous suspensions of solids with a wide particle size range having comparatively coarse materials including some larger than 65 mesh and very fine materials including some smaller than 325 mesh settle out with the solids in unclassified and in resuspendable form, when settling in the hindered state under non-Stokes conditions, is effected in the presence of a polymer of the acrylamide-acrylic acid-acrylonitrile type which causes the fines to remain with the large particles and settle out comparatively homogeneously.

This aids in preventing deposits of coarse materials in settling tanks, leach tanks, internal combustion engines and their radiators, heat exchangers, cooling towers, flowing streams in natural or man-made water courses, and mine operations, and the polymer in solution can penetrate into coarse material with fines so that settled material can be resuspended, even if the polymer is introduced after at least some settling has occurred.

3,746,642

SINTERED POWDERED METAL FILTER

Theodore Bergstrom, Little Canada, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

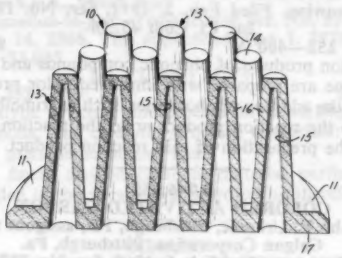
Continuation-in-part of Ser. No. 5,019, Jan. 22, 1970, abandoned, Continuation-in-part of Ser. No. 817,673, April 21, 1969, abandoned. This application Apr. 20, 1971, Ser. No. 135,638

Int. Cl. B01d *39/20*

U.S. Cl. 210—446 **7 Claims**

A unitary uniformly porous filter structure constructed entirely of shaped sintered powdered metal having increased filtering capacity and useful for filtering molten thermoplastic resin, e.g., as it is forced through a spinnerette head. The filter

has a planar base portion having hollow protuberances extending from one major surface thereof with cavities of the protuberances extending to the opposite major surface,



providing a drainage path. The filter structure is one piece of metal, i.e., the protuberances and the base have continuity and identity of composition.

3,746,643

GREASE AND RUST INHIBITOR COMPOSITIONS

Lynn C. Rogers, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

No Drawing. Continuation-in-part of abandoned application Ser. No. 727,720, May 8, 1968. This application Oct. 21, 1970, Ser. No. 82,825
Int. Cl. C10m *5/22, 7/38*
U.S. Cl. 252—33 26 Claims

Grease and rust inhibitor compositions consisting of 5–80 parts by weight of an oil soluble dispersing agent selected from sulfonic acids, aliphatic monocarboxylic acids, and alkaline earth metal salts thereof, 5–45 parts by weight of an alkaline earth metal carbonate, and 0.5–60 parts by weight of microcrystalline wax having a melting point in the range of from about 145° F. to about 190° F. Said compositions, also, may contain a minor amount of a nonvolatile diluent oil. Also, a solution of said compositions in a volatile solvent may be applied to coat metal surfaces.

3,746,644

N-SUBSTITUTED FATTY ACID AMIDE LUBRICANTS

Frank C. Magne, Robert R. Mod, and Gene Sumrell, New Orleans, La., and Winfred E. Parker, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 31, 1971, Ser. No. 176,734
Int. Cl. C10m *1/38*
U.S. Cl. 252—47.5 16 Claims

This invention relates to N-acylmorpholines and N-mono and N,N-disubstituted fatty acid amides and to similar derivatives of epithioamides which are useful as base and extreme pressure lubricants and additives.

3,746,645

POLYETHER SERIES SYNTHETIC LUBRICATING OIL COMPOSITIONS

Masahiro Saito, Sagamihara, Yoshiharu Tanizaki, Kamakura, and Keiichi Furuta and Kenichiro Minagawa, Kawasaki, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

No Drawing. Filed Nov. 26, 1971, Ser. No. 202,652
Claims priority, application Japan, Dec. 4, 1970, 45/107,264
Int. Cl. C10m *3/30*
U.S. Cl. 252—51.5 A 4 Claims

Lubricating oil composition for an engine oil is obtained by adding a polyoxyalkylene glycol ether N-amine substituted succinimide to a polyoxyalkylene glycol ether.

3,746,646

DETERGENT WASHING COMPOSITION

Daniel Boixader, Bry-sur-Marne, France, assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Apr. 16, 1971, Ser. No. 134,894
Int. Cl. C11d *7/54*
U.S. Cl. 252—95 7 Claims

A detergent washing composition containing an alkali salt of a hydroperoxide and a water-soluble synthetic organic surface active agent.

3,746,647

MAKING SOAP BARS

Leo Peloquin, Kensington, Md., assignor to The Gillette Company, Boston, Mass.

Filed Mar. 12, 1971, Ser. No. 123,586
Int. Cl. C11d *17/00*
U.S. Cl. 252—91 2 Claims

A soap bar comprising a substantial depth of discrete soap fragments consolidated into an integral mass with adjacent fragments separated by a zone or layer of visually exposed water-insoluble pigment particles arranged to separate the interfaced borders of the fragments throughout the useful life of the fragments, the particles being of a color visually distinct from that of the fragments separated thereby, and having an average largest dimension at most $\frac{1}{100}$ of that of the separated soap fragments.

3,746,648

STABILIZER COMPOSITION

Lawrence Peoples, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 832,865, June 12, 1969. This application Mar. 22, 1971, Ser. No. 126,909
Int. Cl. C11d *7/52*
U.S. Cl. 252—171 4 Claims

1,1,1-trichloroethane can be stabilized at temperatures up to about 100° F. in the presence of aluminum and its alloys by incorporating thereinto at least (a) 4 weight percent of dimethoxymethane (DMM) alone or as a mixture of from 100 to 62 percent DMM and 0 to 38 percent tertiary butyl alcohol (TBA), (b) at least 0.5 weight percent of butylene oxide (BO) or propylene oxide (PO) or a mixture thereof, and (c) 0.25 volume percent (0.20 weight percent) of secondary butyl alcohol (SBA).

The above composition can be admixed with methylene chloride which may contain production and storage stabilizers, e.g., cyclohexane, 0.025 volume percent based on the methylene chloride, so long as the minimum amount of total inhibitor in the mixture equals at least 4 percent of the DMM or DMM/TBA component based on the mixture of chlorinated solvents, at least 0.5 percent of the BO/PO component based on the mixture, and at least 0.25 volume percent (0.20 weight percent) of the SBA component based on the 1,1,1-trichloroethane present in any mixture.

3,746,649

STABLE LIQUID ENZYME PRODUCT

John H. Barrett, Jr., 1204 Pine St., Norwalk, Calif. 90650

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,894
Int. Cl. C11d *7/42*
U.S. Cl. 252—170 17 Claims

Liquid enzyme product stable against proteolytic degradation and consisting essentially of an enzyme of the amylose or protease type and 100 to 500 parts, per part of the enzyme, of an organic liquid medium free of glycerine and not a solvent for the enzyme and selected from certain alcohols, alkylene glycols, alkylene glycol alkyl or phenyl ethers, alkylene glycol esters, alkoxy ethanols and propanols and alkoxy triglycols, and an enzyme ingredient comprising alkaline or neutral protease or amylase; the product can be packaged in an aerosol container for user convenience.

3,746,650

ORGANIC, RADIOISOTOPE-CONTAINING, CARBONACEOUS MATRIX HEATED IN INERT ATMOSPHERE

Thomas N. Lahr, Roseville, and Richard E. Volkmann, Arden Hills, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Feb. 26, 1970, Ser. No. 14,683
Int. Cl. A61r *27/04*
U.S. Cl. 252—301.1 R 9 Claims

The disclosed radioactive source preferably is obtained by heating a particulate ion exchange resin, containing one or more radioisotopes ion-exchanged therein, in an oxygen-free atmosphere. The resulting heat-treated particles contain the radioisotopes non-leachably bound up in a carbonaceous matrix. The heat-treated particles have good chemical and physical integrity and a low inorganic ash content.

3,746,651

RADIOTHERMOLUMINESCENT MATERIALS AND RADIOTHERMOLUMINESCENCE DOSIMETERS

Noboru Kotera, Kamakura, Satoru Nishikawa, Yokosuka, and Hitoshi Sakamoto, Chigasaki, Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka-shi, Japan

Filed Aug. 7, 1970, Ser. No. 62,116
Claims priority, application Japan, Aug. 13, 1969, 44/64,111
Int. Cl. C09k *1/54*
U.S. Cl. 252—301.4 F 6 Claims

Complex oxide luminescent material consisting of magnesium oxide-silicon dioxide and containing trace amount of terbium or cerium as an activator shows strong thermoluminescence with the flow peak at ca. 190° C. under excitation by means of electron beam or various radiations and thus is useful as the phosphor for thermoluminescent dosimeter.

3,746,652

METHOD FOR PRODUCING EUROPIUM ACTIVATED YTTRIUM VANADATE PHOSPHOR

James E. Mathers, Ulster, Felix F. Mikus, Towanda, and Ramon L. Yale, Ulster, Pa., assignors to GTE Sylvania Incorporated

No Drawing. Original application May 28, 1970, Ser. No. 41,562, now Patent No. 3,653,816. Divided and this application Sept. 13, 1971, Ser. No. 180,184
Int. Cl. C09k *1/44*
U.S. Cl. 252—301.4 R 3 Claims

A highly pure ammonium metavanadate with improved particle size and bulk density is produced from an impure ammonium metavanadate by dissolving the impure ammonium metavanadate in water, maintaining controlled temperature conditions for a period of time, filtering, maintaining the filtrate under controlled pH and temperature conditions for a specified period of time, crystallizing solid ammonium metavanadate, washing the crystals with water, vacuum drying under controlled temperature and heat treating under agitation and controlled temperature conditions. The metavanadate is fired with a yttrium and europium source to produce a europium activated yttrium vanadate phosphor.

3,746,653

JET DYEING FOAM CONTROL

John W. Churchfield, Delran, N.J., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed May 15, 1972, Ser. No. 253,616
Int. Cl. B01d *17/00*
U.S. Cl. 252—321 10 Claims

A foam control agent particularly useful in jet dyeing of textiles is disclosed. The composition consists essentially of (1) a siloxane glycol copolymer, (2) a liquid polydimethylsiloxane, (3) silica, (4) a siloxane resin, and (5) a siloxane copolymer.

3,746,654

PROCESS FOR IMPROVING THE COLOR CHARACTERISTICS OF ANTIOXIDANTS

Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Feb. 2, 1971, Ser. No. 112,033
Int. Cl. C08f *45/58*
U.S. Cl. 252—400 A 8 Claims

Reaction products of phenolic compounds and dicyclopentadiene are prepared with improved color propereties through the addition of phosphites, such as trimethyl phosphite, to the reaction product or to the reaction mixture during the preparation of said reaction product.

3,746,655

COLORED ACTIVATED CARBON

John E. Urbanic, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,688
Int. Cl. B44d *1/94, 1/44*
U.S. Cl. 252—430 5 Claims

Particulate activated carbon may be made with a colorful decorative coating without sacrificing a significant portion of its adsorptivity, by utilizing a thermoplastic resin as a medium for coating the carbon and adhering a pigment to the coating.

3,746,656

CATALYST FOR THE PRODUCTION OF ACRYLONITRILE

Tatsuo Shiraishi, Shinkichi Shimizu, and Hiroshi Ichihashi, Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-shi, Osaka-fu, Japan

No Drawing. Filed May 28, 1971, Ser. No. 148,165
Claims priority, application Japan, May 29, 1970, 45/46,667
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 5 Claims

In the production of acrylonitrile by a vapor phase reaction of propylene, ammonia and oxygen at an elevated temperature, a process which comprises contacting propylene, ammonia and oxygen with a catalyst composition comprising a catalyst system of the formula:

$$Tl_aP_bMo_cFe_dBi_eX_fO_g$$

wherein X represents one or more of the metals, Ni, Mg and Co, and *a*, *b*, *c*, *d*, *e*, *f* and *g* represent respectively the relative number of atoms of each component; provided that when *c* is 12, *a* is 2 or less, but not 0; *b* is 0 to 5; *d* is 0.1 to 5; *e* is 0.1 to 5; *f* is 2 to 15; and the value of *g* depends on the number of the other atoms and is usually from 38.3 to 81.5.

3,746,657

CATALYST MANUFACTURING PROCESS

Arthur F. Miller and Wilfrid G. Shaw, Lyndhurst, and Hugh M. Blythe, Lima, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

No Drawing. Filed June 28, 1971, Ser. No. 157,659
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 10 Claims

An improved process for the manufacture of a catalyst particularly suitable for use in a "fluidized" bed reactor and comprising an oxide of molybdenum and a supporting material derived from a colloidal sol of an oxide of silicon, aluminum, titanium or zirconium as essential ingredients and optionally the oxide or oxides of one or more additional elements, said process comprising the steps of preparing a slurry of the catalyst components by adding to an aqueous suspension of a molybdate compound the necessary ingredients in the following order: (a) the required amount of colloidal sol of the supporting oxide, (b) acidic components in the form of their corresponding acids, (c) the remaining metal components as a solution of the combined metal salts; spray drying the resultant catalyst slurry, and calcining the spray dried particles at an elevated temperature.

3,746,658
CATALYSTS
Paolo Della Porta, Tiziano A. Giorgi, Bruno Kindl, and Mario Zucchinelli, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy
Continuation-in-part of application Ser. No. 527,906, Feb. 16, 1966. This application May 1, 1970, Ser. No. 33,695
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 5 Claims

A catalytic structure and process for catalyzing chemical reactions. The catalytic structure comprises:
(a) a metallic substrate; and
(b) a finely divided catalytic material partially embedded in the substrate and projecting therefrom.

3,746,659
FLUID CRACKING CATALYST AND PREPARATION THEREOF
John P. Horzepa, Edison, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Woodbridge, N.J.
No Drawing. Filed June 25, 1971, Ser. No. 157,007
Int. Cl. B01j *11/44, 11/40*
U.S. Cl. 252—448 6 Claims

An aluminum silicate catalyst suitable for cracking hydrocarbons or as a carrier for catalytic materials is prepared by spray drying kaolin clay to form microspheres, calcining the microspheres at about 1350° F., immersing the calcined microspheres in water to form a slurry, heating the slurry under superatmospheric pressure and removing water from the microspheres.

3,746,660
METHOD OF PREPARING A CATALYST FOR THE HYDROREFINING OF RESIDUAL OILS
Mark J. O'Hara, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 6, 1971, Ser. No. 205,340
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R 5 Claims

An improved method of preparing a catalyst comprising a Group VI–B and Group VIII metal impregnated on a refractory inorganic oxide carrier material, said catalyst being particularly useful in the hydrorefining of residual oils of high asphaltene content. The carrier material, prior to impregnation with the Group VI–B and Group VIII metal components, is dried to reduce the volatile content thereof to not less than about 30 wt. percent, and calcined in an oxidizing atmosphere at a temperature increasing from about 200° to about 600° C. in a period from about 30 to about 90 minutes, and thereafter at a temperature of from about 600° to about 800° C. The catalyst so prepared is designed primarily for the conversion of C_7 insoluble asphaltenes.

3,746,661
METHOD OF PREPARING A CATALYST FOR THE HYDROREFINING OF RESIDUAL OILS
Mark J. O'Hara, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Dec. 6, 1971, Ser. No. 205,341
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R 5 Claims

An improved method of preparing a catalyst comprising a Group VI–B and Group VIII metal impregnated on a refractory inorganic oxide carrier material, said catalyst being particularly useful in the hydrorefining of residual oils of high asphaltene content and being particularly effective for the conversion and separation of sulfurous components in said residual oils. The carrier material, prior to impregnation with the Group VI–B and Group VIII metal components, is dried to reduce the volatile content thereof to less than about 30 wt. percent, and calcined in an oxidizing atmosphere at a temperature increasing from about 125° to about 600° C. in a period from about 30 to about 90 minutes, and thereafter at a temperature of from about 600° to about 800° C.

3,746,662
CONDUCTIVE SYSTEMS
Robert Leonard Adelman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Aug. 9, 1971, Ser. No. 170,308
Int. Cl. H01b *1/02*
U.S. Cl. 252—513 19 Claims

Polymerizable suspensions for the formation of thermally and/or electrically conductive coatings comprising (a) certain epoxy resins having a viscosity at 25° C. below 10 poises, said epoxy resins having dispersed therethrough (b) certain tough polymer particles, (c) finely divided metal particles and (d) a curing agent for (a). Also objects incorporating the cured dispersion, such as tantalum capacitors incorporating the same.

3,746,663
PROCESS FOR PREPARATION OF A POLYURETHANE FOAM USING A POLYMERIC LIQUID FOAM STABILIZER
John H. Beale, Wallingford, and Felix P. Carroll, Chester, Pa., assignors to Air Products and Chemicals, Inc., Wayne, Pa.
No Drawing. Filed Sept. 13, 1971, Ser. No. 180,183
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AG 5 Claims

A cell stabilizer composition, particularly effective in high rise polyurethane rigid and semi-rigid foam bodies, is an effective amount of the entire liquid reaction product obtained from the polymerization of a monomeric system consisting of or comprising N-vinyl pyrrolidone in a polyol polymerization medium. The polymerizable monomeric system is selected from the group consisting of N-vinyl pyrrolidone; N-vinyl pyrrolidone-dibutyl maleate; and N-vinyl pyrrolidone-dibutyl maleate-vinyl acetate. The polyol employed as the polymerization medium is the reaction product of the alkylene oxide treatment of polyhydric alcohols having 2 to 8 hydroxyl groups. A polymerization initiator is employed.

3,746,664
URETHANE FOAMS WITH REDUCED SMOKE LEVELS AND IMPROVED FLAME SPREAD
Herman P. Doerge, Oakmont, and Marco Wismer, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Filed July 2, 1971, Ser. No. 159,534
The portion of the term of the patent subsequent to Feb. 1, 1989, has been disclaimed
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 AM 13 Claims

This invention relates to polyurethane foams having reduced smoke levels and improved flame spread characteristics. The invention comprises incorporating particulate fumaric acid or into a polyurethane foam formulation wherein the polyol employed is a polyether polyol.

3,746,665
POLYURETHANE BASED ON BLENDS OF POLY (OXYCAPROYL) DIOLS AND POLY(OXYTETRAURETHYLENE) DIOLS
Joseph V. Koleske and George Magnus, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Aug. 2, 1971, Ser. No. 168,419
Int. Cl. C08g *22/44, 22/10, 41/04*
U.S. Cl. 260—2.5 AN 9 Claims

This invention relates to the manufacture of poly(oxytetramethylene)-polyurethane products which exhibit markedly improved tensile strength while retaining a high level of other mechanical properties. These products are prepared by reacting (i) a mixture of polymeric diols

which comprise defined amounts of relatively high molecular weight poly(oxycaproyl) diol and relatively low molecular weight poly(tetramethylene oxide) glycol with (ii) a diisocyanate compound and (iii) a difunctional chain extender, and optionally, additional ingredients such as catalyst, surfactant, blowing agent, dyes, etc.

3,746,666

WATER ABSORBABLE RIGID URETHANE FOAM COMPOSITIONS

Gerald Wayne Neal and Llewellyn Delphin Booth, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,366
Int. Cl. C08g *22/14, 22/46*
U.S. Cl. 260—2.5 AD **4 Claims**

Water absorbable rigid polyether polyurethane foam compositions useful as floral foams, baffles and filters are prepared by subjecting to foaming conditions a composition comprising (A) an amine initiated, highly branched polyether polyol, (B) a highly branched hydroxyl initiated polyether polyol, (C) a lightly branched hydroxyl initiated polyether polyol and (D) a polymethylene polyphenyl isocyanate.

3,746,667

CATALYTIC PROCESS FOR PREPARING FOAM FROM A NITRILE CARBONATE AND A NUCLEOPHILIC COMPOUND

Jerry A. Dieter, Huntington Woods, Mich., Larry G. Wolgemuth, Cherry Hill, N.J., and Thomas J. Ryan, Yeadon, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Sept. 21, 1971, Ser. No. 182,529
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 A **11 Claims**

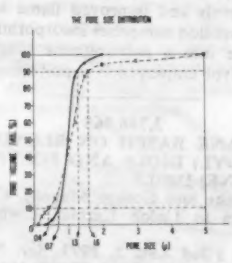
A catalyst system for preparing a foam from a cyclic nitrile carbonate and a polyol or a polythiol is provided from a multi-component catalyst system comprising an aluminum-containing compound, a tin-containing compound and a third compoent selected from alkali metal-containing compounds and tertiary organic amines.

3,746,668

PROCESS FOR PREPARING A POROUS NYLON FILM

Nobuo Hiratsuka and Masaru Horiguchi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1971, Ser. No. 212,371
Claims priority, application Japan, Dec. 26, 1970, 45/118,981
Int. Cl. C08j *1/26*
U.S. Cl. 260—2.5 M **3 Claims**



Cyclic ethers are used as gelling agents in the preparation of a finely porous nylon film. The cyclic ethers accelerate the progress of gelation and render pore size distribution uniform.

3,746,669

REINFORCED RUBBER COMPOSITION

Donald D. Dunnom, Pittsburgh, Pa., and Melvin P. Wagner, Barberton, and George C. Derringer, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 8,059, Feb. 2, 1970, which is a continuation-in-part of application Ser. No. 758,572, Sept. 9, 1968, both now abandoned. This application Feb. 8, 1971, Ser. No. 113,735
Int. Cl. C08d *9/10;* **C08g** *37/16*
U.S. Cl. 260—3 **16 Claims**

The invention comprises a reinforced rubber composition including rubber, discontinuous fiber filaments, a finely-divided reinforcing siliceous pigment, and a resin formed by the reaction of a phenol with a methylene donor.

3,746,670

AUTOMOBILE POLYESTER BODY FILLER

Harold P. McGuire, 5636 S. Hoyne St., Chicago, Ill. 60636

No Drawing. Filed May 13, 1971, Ser. No. 143,253
Int. Cl. C08g *39/10*
U.S. Cl. 260—7.5 **3 Claims**

A composition comprising a liquid component including a polyester resin and an accelerator and a dry filler component consisting essentially of a uniform mixture of asbestos fibers, metallic powder and soybean meal, the soybean meal functioning as an adhesive agent to bond the components together and thereby enhance workability while minimizing dusting of the compound during working thereof.

3,746,671

AQUEOUS POLYMER DISPERSION, METHOD OF PRODUCING SAME, AND THEIR USE AS BINDERS IN PAPER COATINGS

Herbert Zima and Josef Forstner, Graz, Austria, assignors to Vianova-Kunstharz, A.G., Vienna, Austria

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,187
Int. Cl. C08f *29/42*
U.S. Cl. 260—8 **5 Claims**

Aqueous polymer dispersions, and their method of manufacture, for use in combination with natural binders as pigment binders in paper coatings, comprising vinyl acetate, and ethyl acrylate, or higher vinyl esters and mixtures thereof characterized in that

70–95 percent by weight of vinyl acetate
5–30 percent by weight of ethyl acrylate or higher vinyl esters of straight chain monocarboxylic acids with up to 12 carbon atoms or mixtures thereof
0–5 percent by weight of vinylsulfonic acid and/or styrene-sulfonic acid

are polymerized in the presence of an emulsifying agent blend consisting essentially of

(I) 5–95 percent by weight of an alkylated aromatic hydroxy compound with straight or branched hydrocarbon chain with 6–20 carbon atoms, which has been reacted per each mole with 2–8 moles ethylene oxide or propylene oxide and sulfonated subquently,
(II) 0–95 percent by weight of an alkylated aromatic hydroxy compound with straight or branched hydrocarbon chain with 6–20 carbon atoms, which has been reacted per each mole with 1–40 moles ethylene oxide or propylene oxide,
(III) 0–95 percent by weight of a compound of the general formula

$$HO-(CH_2-CH_2-O-)_a-\left(\begin{matrix}CH-CH_2-O-\\ |\\ CH_3\end{matrix}\right)_b-(CH_2-CH_2-O-)_c-H$$

in which a=2–40, b=6–35, c=2–40,

the total of emulsifying agents being 100 percent, and in the presence of a redox system as polymerization catalyst, are described.

3,746,672
METHOD OF DELUSTERING ACRYLIC FIBERS
Darrell R. Thompson, Somerville, N.J., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Filed Mar. 30, 1971, Ser. No. 129,626
Int. Cl. C08f *29/54*
U.S. Cl. 260—17 R **8 Claims**

Delustering polyacrylonitrile fibers by dispersing a particulate delustrant in a solution of a cellulose ester, incorporating the delustrant dispersion into polyacrylonitrile spinning solution and stabilizing the spinning solution mixture against flocculation.

3,746,673
AZIRIDINYL ALKYL-ACRYLATE OR METH-ACRYLATE GRAFT COPOLYMERS
John A. Simms, Wilmington, Del., and Aloysius N. Walus, Flint, Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Dec. 22, 1970, Ser. No. 100,830
The portion of the term of the patent subsequent to Mar. 21, 1989, has been disclaimed
Int. Cl. C08f *45/34, 45/36*
U.S. Cl. 260—22 CB **44 Claims**

The graft copolymer consists essentially of a backbone segment of polymerized ethylenically unsaturated monomer units and side chain segments grafted into the backbone through an aziridinyl acrylate or methacrylate coupling unit. These graft copolymers are particularly useful in forming coating compositions which may be in the form of aqueous dispersions, organosols or lacquers and these compositions form useful finishes for trucks, automobiles, airplanes, appliances such as refrigerators, stoves, washing machines, and the like and can be used as primers and/or sealer compositions.

3,746,674
VULCANIZATION OF HALOGEN-CONTAINING ACRYLIC ELASTOMERS
Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed June 30, 1971, Ser. No. 158,600
Int. Cl. C08f *27/06*
U.S. Cl. 260—23 AR **12 Claims**

A vulcanization composition is provided which comprises a halogen- or epoxy-containing polyacrylate elastomer, from about 0.05 to 2.5 percent of sulfur, from about 0.5 to 7 percent of an alkali metal salt of an organic carboxylic acid and from about 0.25 to 3 percent of sodium or potassium acetate or propionate based on the weight of the elastomer. In addition, an improved process for vulcanizing the elastomers is provided which comprises adding to a soap and sulfur vulcanization composition from about 0.25 to 3 percent of sodium or potassium acetate or propionate.

3,746,675
HEAT SENSITIVE RECORD MATERIAL
James H. Blose, Appleton, Wis., and Shashikant G. Talvalkar, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
No Drawing. Original application July 15, 1970, Ser. No. 55,233, now Patent No. 3,674,535. Divided and this application Mar. 22, 1972, Ser. No. 236,979
Int. Cl. C08f *19/14*
U.S. Cl. 260—23 EM **3 Claims**

A heat sensitive record material which comprises (1) a base sheet such as paper, and (2) a coating of a colorless chromogenic material and a bis phenol distributed in a polyvinyl alcohol in combination with a filler such as clay, a lubricant such as zinc stearate and a nontacky wax. Conventional wetting agents and defoamers also are present in the record material. This material is resistant to pick-off of the record sheet surface and freeze-sticking of the record sheet to the printing heat when the record material is used in conjunction with a rapidly heated and cooled printing head.

3,746,676
DECORATABLE POLYOLEFIN PLASTICS
Frederick B. Joyner and George O. Cash, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Mar. 23, 1971, Ser. No. 127,370
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 **8 Claims**

A polyolefin composition comprising (1) about 35 to 92 percent of a crystalline polymer of an α-olefin having 2 to 8 carbon atoms containing at least 90 percent α-olefin units and at least part of which has been chemically combined with maleic anhydride, (2) 0 to 30 percent of a crystalline ethylene polymer having a density of about 0.91 to about 0.97, (3) about 5 to 20 percent of an ethylene-propylene copolymer rubber containing 20 to 80 percent ethylene units, and (4) about 3 to about 15 percent of rosin. These polyolefin plastics exhibit excellent adhesion to paints, lacquers, and inks without the need for expensive primers or other surface treatments.

3,746,677
ADHESIVE COMPOSITION HAVING HIGH INITIAL ADHESIVE STRENGTH
Haruhiko Arai, Narashino, and Shoji Horin, Ichikawa, Japan, and Iwao Maruta, deceased, late of Funabashi, Japan, by Koyoko Maruta and Yoshi Maruta, heirs, Funabashi, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
No Drawing. Filed Mar. 4, 1971, Ser. No. 121,197
Claims priority, application Japan, Mar. 5, 1970, 45/18,880
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 R **3 Claims**

The invention relates to a composition having high initial adhesive strength consisting of a mixture of (A) a synthetic high molecular weight vinyl compound in aqueous dispersion with (B) a resin acid surface active agent and (C) a vinyl polymer emulsion.

3,746,678
AMINE-MODIFIED POLYALKYLENE OXIDES
Clarence R. Dick, Lake Jackson, and Eldon L. Ward, Angleton, Tex., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 13, 1971, Ser. No. 180,193
Int. Cl. C08g *23/20*
U.S. Cl. 260—2 A **19 Claims**

Water-soluble alkylene oxide polymer having pendant aminoalkylaminomethyl groups are obtained by reacting polyepichlorohydrin or similar polymer with an alkylenediamine or a polyalkylenepolyamine. These products can be lightly cross-linked by reacting with a difunctional reagent such as ethylene dichloride or epichlorohydrin without destroying their solubility in water. The products are drainage aids in paper pulp slurries or are intermediates for making such drainage aids.

3,746,679
COATING COMPOSITIONS CONTAINING AQUEOUS DISPERSIONS OF ETHYLENE-VINYL ACETATE COPOLYMERS
John Joseph Seipel, Jr., 346 Euclid Ave., Ambler, Pa. 19002
No Drawing. Continuation-in-part of application Ser. No. 756,408, Aug. 30, 1968. This application May 4, 1971, Ser. No. 140,307
Int. Cl. C08f *45/26*
U.S. Cl. 260—29.6 ME **3 Claims**

General purpose water-based mastic compositions suitable for application and curing at temperatures below the

freezing point of water which comprise a uniform aqueous emulsion containing (a) an ethylene vinylacetate copolymer (b) an alkylene glycol solvent (c) a glycol acetate ester or a glycol ester and (d) an alkylaryl polyether alcohol.

3,746,680

PLASTER OF PARIS COMPOSITION

Joseph Boricheski, South River, N.J., assignor to Johnson & Johnson

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,749

Int. Cl. A61f 13/04

U.S. Cl. 260—29.2 EP 22 Claims

A settable composition and a cast-forming material comprising the composition bonded to a flexible carrier are provided for making orthopedic casts. The composition and the material, when wetted, exhibit a smooth and creamy texture, and an orthopedic cast, formed by applying the material, exhibits high "green strength" (as measured one hour after cast application). The settable compostion comprises plaster of Paris and a thermoplastic, water-soluble resin or a mixture of resins of extremely high molecular weight and high degree of crystallinity and preferably resinous mixtures of poly(ethylene oxide) having average molecular weights ranging from about 100,000 to about 4,000,000.

3,746,681

PROCESS OF PREPARING FINELY DIVIDED THERMOPLASTIC RESINS

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 775,147, Nov. 12, 1968, which is a continuation of application Ser. No. 370,006, May 25, 1964, now Patent No. 3,422,049, which in turn is a continuation-in-part of abandoned application Ser. No. 160,733, Dec. 20, 1961. This application July 6, 1971, Ser. No. 160,194

The portion of the term of the patent subsequent to Jan. 14, 1986, has been disclaimed

Int. Cl. C08b 29/36; C08f 47/18; C08g 53/20

U.S. Cl. 260—29.6 PM 7 Claims

A process for preparing finely divided thermoplastic resins such as polyethylene which comprises vigorously agitating molten resin in admixture with water and in the presence of a block copolymer of ethylene oxide and propylene oxide to produce a fine dispersion, and then cooling the resulting dispersion to a temperature below the melting point of the resin. The recovered finely divided thermoplastic resins are characterized by a narrow particle size distribution and substantially spherical shapes.

3,746,682

SYNERGISTIC ANTIBLOCK SYSTEMS FOR A 2-ETHYLHEXYL ACRYLATE/ACRYLONITRILE COPOLYMER

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Oct. 3, 1972, Ser. No. 294,698

Int. Cl. C08f 45/44

U.S. Cl. 260—32.6 N 4 Claims

Acrylate film such as the polymers of 2-ethylhexyl acrylate and acrylonitrile are compounded with a combination of fatty amides to improve the antiblocking characteristics of the film.

3,746,683

THROMBORESISTANT ARTICLES MADE FROM POLYURETHANES CONTAINING A POLYPROPYLENE GLYCOL-ETHYLENE OXIDE BLOCK COPOLYMER

Ival O. Salyer, Dayton, and Albert J. Blardinelli, Kettering, Ohio, assignors to the United States of America as represented by the Secretary, Department of Health, Education, and Welfare

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,425

Int. Cl. C08g 51/34

U.S. Cl. 260—33.2 R 4 Claims

Articles (includes containers, conduits, devices or materials) for handling (includes containing, transporting or contacting) blood and reducing clotting comprising a mixture of a polyurethane; with at least a sufficient amount to give improved thromboresistance in the range of about 0.5 to 20% by weight based on said polyurethane of a thromboresistant polymer additive which is a polyethylene glycol, a polypropylene glycol or a block copolymer of the structure

$$HO(CH_2-CH_2-O)_a\left(\begin{matrix}CH-CH_2-O\\ |\\ CH_3\end{matrix}\right)_b(CH_2-CH_2-O)_cH$$

wherein *a*, *b* and *c* are each at least 1 and represent the number of moles of these groups, and the molecular weight of the polymer additive is in the range of about 500 to 15,000. The articles described in the previous sentence have improved nonthrombogenic (thromboresistant) properties as compared to those made from conventional polyurethanes.

3,746,684

POLY-[IMINO(2,5-DIALKOXYCARBONYL-1,4-PHENYLENE)IMINOARYLENE]

Kazuo Adachi, Akira Tai, Fukuji Higashi, and Katsuya Shibata, Tokyo, Japan, assignors to Tekkosha Co., Ltd., Tokyo, Japan

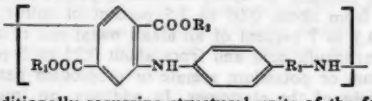
Filed Oct. 18, 1971, Ser. No. 189,877

Claims priority, application Japan, Oct. 20, 1970, 45/91,667

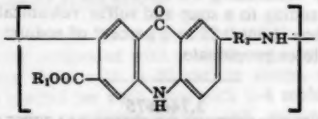
Int. Cl. C08g 17/02, 33/06

U.S. Cl. 260—47 CP 6 Claims

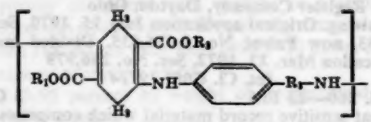
A new high polymer comprising recurring structural units of the formula



and additionally recurring structural units of the formula



is obtained by oxidation of high polymer comprising recurring structural units of the formula



which may be obtained from a reaction between dialkyl succinyl-succinates and aromatic diamines. The new high polymer is a heat resistant resin being characterized by spectroscopic absorption IR spectra at the vicinities of

2.59, 5.92, 6.38, 6.50, 6.55, 9.10, 9.50, 11.5 and 12.7μ. It can be used to make films, sheets, coatings for metals and as various shaped moldings.

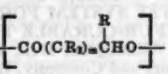
3,746,685

CURABLE MIXTURES OF EPOXIDE RESINS AND POLYMERCAPTANS

Bryan Dobinson, Duxford, Bernard Peter Stark, Stapleford, and Eric Whichell Young, Saffron Walden, England, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,595
Int. Cl. C08g 30/10
U.S. Cl. 260—47 EC 10 Claims

Polymercapto, containing at least two mercaptan (—SH) groups per molecule, which are esters of a monomercaptocarboxylic acid with a substance having at least two alcoholic hydroxyl groups per molecule and containing a repeating unit of formula



where m is an integer of at least 4 and at most 6 in each unit, at least $(m+2)$ of the R's denote hydrogen, and the remaining R's denote hydrogen or methyl or ethyl.

3,746,686

PROCESS FOR CURING POLYEPOXIDES WITH POLYCARBOXYLIC ACID SALTS OF AN IMIDAZOLE COMPOUND AND COMPOSITIONS THEREOF

Clifford D. Marshall, Cherry Hill, N.J., Paul S. Byrd, Farmington, Mich., and Mark F. Dante, Moraga, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 727,681, May 8, 1968. This application July 12, 1971, Ser. No. 161,991
Int. Cl. C08g 30/14
U.S. Cl. 260—47 EN 10 Claims

Curable epoxy resin compositions comprise (1) a polyepoxide and (2) a salt of (a) a polycarboxylic acid or anhydride and (b) an imidazole compound. A process for preparing resinified products from such compositions is also disclosed.

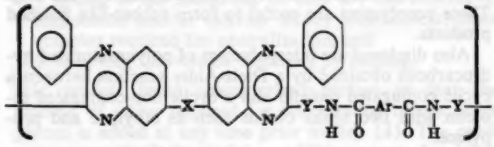
3,746,687

PHENYLATED AMIDE-QUINOXALINE COPOLYMERS

James V. Duffy, Beltsville, Md., and Joseph M. Augl, Sterling, Va., assignors to the United States of America as represented by the Secretary of the Navy

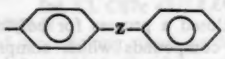
No Drawing. Filed Nov. 21, 1972, Ser. No. 308,383
Int. Cl. C08g 15/00, 33/02
U.S. Cl. 260—50 11 Claims

Phenylated amide-quinoxaline copolymers consisting essentially of units of the formula



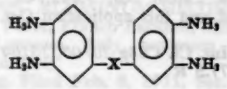
where X is a direct bond,

O, S, SO, or SO_2, Y is m or p-phenylene and Ar is ortho, meta or para phenylene or

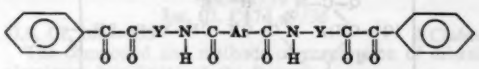


wherein Z is a direct bond,

O, S, SO or SO_2 are prepared by contacting a tetramine of the formula



with an amide of the formula



These polymers find use as films or coatings and can also be made into fibers.

3,746,688

CONTINUOUS DRYING AND CRYSTALLIZATION PROCESS FOR POLYESTERS

Eugene E. Berkau, Cincinnati, Ohio, assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 4, 1971, Ser. No. 169,125
Int. Cl. C08g 17/003, 22/10
U.S. Cl. 260—75 T 5 Claims

Wet amorphous polyethylene terephthalate flake is dried by exposing the flake to a temperature just below the crystallization temperature under high vacuum until the moisture content of the flake is less than about 0.05 percent; thereafter raising the temperature to above the crystallization temperature with minimal mechanical agitation.

3,746,689

POLYISOCYANATES BLOCKED WITH POLYHALOALCOHOLS

T. V. Lakshmi Narayan, Riverview, and Moses Cenker, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Feb. 11, 1972, Ser. No. 225,589
Int. Cl. C07c 125/06; C08g 22/32
U.S. Cl. 260—77.5 TB 11 Claims

Blocked isocyanates are prepared by reacting an organic isocyanate with a haloalkanol of 1 to 6 carbon atoms in the presence of a basic catalyst and at ambient or an elevated temperature. Subsequent unblocking of the isocyanate in the presence of and without damage to the polyol reactant is obtained by heating, typically at about 100° to about 180° C. Comparable after cure physical properties are obtained on polyurethanes prepared with a blocked isocyanate or its nonblocked counterpart.

3,746,690

PROCESS FOR THE MANUFACTURE OF REDISPERSIBLE HYDROPHOBIC STARCH DERIVATIVES

Jan Lolkema, Hoogezand, Netherlands, assignor to Scholten-Honig Research N.V., Foxhol, Netherlands

No Drawing. Filed July 9, 1971, Ser. No. 161,924
Claims priority, application Great Britain, July 14, 1970, 33,993/70
Int. Cl. C08g 22/04
U.S. Cl. 260—77.5 AS 4 Claims

An aqueous suspension of subgranule particles of a water-insoluble hydrophobic starch derivative having a degree of substitution of 0.1 to 1.0 is heated and simultaneously dried in less than 60 seconds at a product temperature of between about 60° and 180° C., and the dry product is comminuted to produce a flaked or powdered, dry hydrophobic starch derivative which is redispersible in water at temperatures below 100° C. to form a stable colloidal suspension of subgranule hydrophobic starch particles.

3,746,691

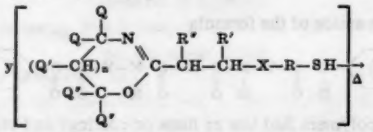
SULFUR-CONTAINING POLYMERS FROM 2-OXAZOLINE AND OXAZINE MONOMERS

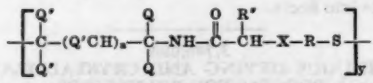
Donald A. Tomalia and Yancey J. Dickert, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application June 16, 1969, Ser. No. 834,612, now Patent No. 3,682,948, dated Aug. 8, 1972. Divided and this application Oct. 18, 1971, Ser. No. 189,828

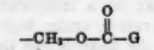
Int. Cl. C08g *20/00, 20/04*

U.S. Cl. 260—77.5 R 2 Claims





wherein R is alkylene (C_2–C_{20}), arylene (C_6–C_{10}), alkylarylene (C_7–C_{15}), alkyl- (C_1–C_{10}) or aryl- (C_6–C_{10}) thiopolyether; or R and with it X, can be void; R', R'', Q' and Q'' are, independently in any occurrence, hydrogen or alkyl (C_1–C_4) or R' can be phenyl; Q in any occurrence is independently hydrogen, methylol or



wherein G is alkyl ($C_{1\text{-}20}$) or phenyl ;and *n* is zero or 1, and *y* designates the molar abundance of monomer for a desired degree of polymerization; and *y* designates also that degree of polymerization: the substances polymerize without catalysis to obtain polyamides with useful resinous properties.

3,746,692

RIGID POLYURETHANE COMPOSITIONS

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 21, 1971, Ser. No. 191,343

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 MA 11 Claims

Rigid, rapid setting polyurethane compositions are prepared from (a) a polyol such as a polyether triol having an average molecular weight of about 260, (b) a polyisocyanate such as toluene diisocyanate, (c) a liquid halogenated aliphatic modifier compound having a boiling point below about 150° C. at atmospheric pressure and having a hydroxy substituent which is capable of reacting with an isocyanate group such as 2-chloroethanol, and (d) an organo-metal catalyst such as lead octoate. These compositions instantly set to form polyurethane products which can be demolded within less than about 5 minutes.

3,746,693

SYSTEM AND PROCESS FOR CONTROLLING POLYMERIZATION OF CONDENSATION POLYMERS

Kashmiri L. Gupta, Kingston, Ontario, Canada, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 768,228, Oct. 17, 1968. This application Feb. 26, 1971, Ser. No. 119,360

Claims priority, application Canada, May 8, 1968, 19,516

Int. Cl. C08g *20/00*

U.S. Cl. 260—78 R 2 Claims

The process for preparing a condensation polyamide polymer in a reactor chamber having a heating means and an exhaust vent is controlled by continuously measuring the flow of exhaust fluids from the polymerization process vented from the reactor under high pressure, comparing the flow rate of the exhaust fluids with a predetermined pattern of exhaust fluid flow and regulating the heating means in response to variations between the exhaust fluid flow and the pattern. The apparatus includes a flow measuring device connected to the vent for producing a first signal representing the flow, a time pattern transmitter for producing a second signal representing a predetermined pattern of exhaust flow, a comparator coupled between the flow measuring device and the time pattern transmitter for producing a third signal representing the difference between the first and second signals and a controller for the heating means actuated by the third signal for varying the amount of heat supplied to the reactor chamber.

3,746,694

NOVEL CATALYST SYSTEM FOR THE PREPARATION OF SULFUR-CURABLE TERPOLYMERS

Edward F. Cluff, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 12, 1970, Ser. No. 63,258

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.78 14 Claims

A process for preparing elastomeric sulfur-curable copolymers of ethylene, a C_4–C_{12} alpha-monoolefin and a C_6–C_{22} non-conjugated diene by contacting the monomers in the presence of a catalyst prepared by simultaneously mixing, in the presence of the C_4–C_{12} alpha-olefin, a titanium halide or oxyhalide, an organolithium compound and an organoaluminum halide of the structure

$$R'_{6-n}Al_2X_n$$

where n=2–4, R' is a monovalent hydrocarbon radical and X is Cl, Br or I. The catalyst of this invention exhibits high catalytic efficiency and results in a reaction mass which is clear and remains practically free from undesirable solids deposition. The polymer products prepared with this catalyst have exceptionally low polyethylene content and exhibit good solubility properties.

3,746,695

INTERPOLYMERS OF POLYCYCLIC POLYUNSATURATED HYDROCARBONS AND CYCLIC OLEFINS

Eilert A. Ofstead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 881,275, Dec. 1, 1969. This application June 14, 1971, Ser. No. 152,977

Int. Cl. C08f *15/04*

U.S. Cl. 260—88.2 D 2 Claims

There is disclosed interpyolymers of cycloolefins and polycyclic polyunsaturated hydrocarbons obtained by a Diels-Alder condensation between a cyclic conjugated diolefin and a cyclic non-conjugated polyunsaturated hydrocarbon containing at least eight carbon atoms in the ring. These copolymers are useful to form rubber-like finished products.

Also disclosed are interpolymers of polyunsaturated hydrocarbons obtained by a Diels-Alder reaction between a cyclic conjugated diolefin and a cyclic non-conjugated diolefin with two alpha olefins such as ethylene and propylene.

3,746,696

CATALYST SYSTEMS FOR POLYMERIZING ALICYCLIC OLEFINS

William A. Judy, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Mar. 25, 1971, Ser. No. 128,116

Int. Cl. C08f *1/34, 5/00*

U.S. Cl. 260—93.1 7 Claims

There is disclosed a process for polymerizing unsaturated alicyclic compounds which comprises contacting

said unsaturated alicyclic compounds with a catalyst system comprising (A) at least one tungsten carbonyl complex compound selected from the group consisting of triphenylphosphine tungsten pentacarbonyl; tri-n-butylphosphine tungsten pentacarbonyl; bistriphenylphosphine) tungsten tetracarbonyl; bisphenylamine)-tungsten tetracarbonyl; bis(diethylamine) tungsten tetracarbonyl; bis (pyridine) tungsten tetracarbonyl; 2,2'-dipyridyl tungsten tetracarbonyl; orthophenanthroline tungsten tetracarbonyl; 3,4,7,8-tetramethyl ortho-phenanthroline tungsten tetracarbonyl; diethylene triamine tungsten tricarbonyl; 1,2,3-triaminopropane tungsten tricarbonyl; 2,2',2''-tripyridyl tungsten tricarbonyl; tris(acetonitrile) tungsten tricarbonyl; tris(propionitrile) tungsten tricarbonyl; mesitylene tungsten tricarbonyl and toluene tungsten tricarbonyl, and (B) at least one reducing agent selected from a group consisting of trialkylaluminum, dialkylaluminum halide, alkylaluminum dihalide, aluminum chloride and aluminum bromide and optionally, a third catalyst component selected from a group consisting of halides, cyanogen halides, peroxides, hydroperoxides and molecular oxygen.

3,746,697

TRIPEPTIDE HAVING THE ACTIVITY OF THE THYROTROPIN RELEASING HORMONE

Karl Folkers, 202 Capri-Lakeway, and Franz H. Enzmann, 1801 S. Lakeshore Blvd., both of Austin, Tex.

No Drawing. Filed Sept. 19, 1969, Ser. No. 859,559
Int. Cl. C07c *103/52*; C07g *7/00*
U.S. Cl. 260—112.5 **2 Claims**

A synthetic product (pyro) glutamyl-histidyl-proline amide, having the specific and unique activities of the thyrotropin releasing hormone of the hypothalamus gland, is obtained from the tripeptide, α-glutamyl-histidyl-proline. The tripeptide can be converted to the amide form by reacting the dimethylester with methanol and ammonia to obtain the (pyro) glutamyl-histidyl-proline amide.

3,746,698

PREPARATION OF HIGHLY BASIC, SULFURIZED ALKYLPHENOLS

Mack W. Hunt and Lynn C. Rogers, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Nov. 10, 1971, Ser. No. 197,519
Int. Cl. C07c *149/38*
U.S. Cl. 260—137 **26 Claims**

A combined process for sulfurizing and overbasing of alkylphenols is disclosed. Briefly, the process comprises the steps of:

(a) forming an admixture of alkylphenol, volatile process solvent, and water,

(b) adding to the admixture of step (a) the amount of magnesium and/or calcium alkoxy alkoxide-carbonate complex required for overbasing,

(c) adding to the admixture of step (b) the amount of magnesium and/or calcium alkoxy alkoxide-carbonate complex required for neutralization, and

(d) removing the volatile materials by heating,

said process being characterized further in that the amount of sulfur required for sulfurization of the alkylphenol is added at any time prior to step (d). The products are particularly useful as additive agents for lubricating oils.

3,746,699

DEXTRIN AND STARCH ETHERS

Leslie P. Kovats, Granite City, Ill., assignor to Anheuser-Busch, Incorporated, St. Louis, Mo.

No Drawing. Filed May 19, 1971, Ser. No. 144,998
Int. Cl. C07c *48/18*
U.S. Cl. 260—209 R **7 Claims**

A process of cross-linking starch or dextrin with glycidyl methacrylate and/or glycidyl acrylate in a base catalyzed reaction is disclosed. The cross-linked starch or dextrin has improved resistance to swelling and is useful in adhesive compositions.

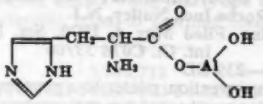
3,746,700

DIBASIC ALUMINUM HISTIDINATE

Franco Parisi, Pavia, Franco Faustini, Milan, and Lavinio Canavesi, Legnano, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,612
Claims priority, application Italy, Feb. 11, 1970, 20,461/70
Int. Cl. C07d *49/36*
U.S. Cl. 260—299 **4 Claims**

The compound and methods of preparation of dibasic aluminum histidinate of the formula



is disclosed. This compound is useful in antagonizing induced gastric ulcer formation.

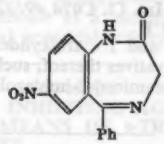
3,746,701

METHOD FOR THE PRODUCTION OF BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto, Hideaki Natsugari, Osaka, and Kanji Meguro and Yutaka Kuwada, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

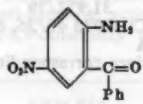
No Drawing. Filed July 27, 1971, Ser. No. 166,627
Claims priority, application Japan, Aug. 1, 1970, 45/67,447, 45/67,448
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D **12 Claims**

Compounds of the formula



(I)

wherein Ph represents a substituted or unsubstituted phenyl group are prepared by reacting a compound of the formula

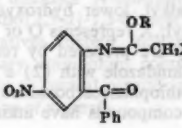


(V)

with a compound of the formula

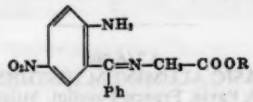
$$XCH_2C(OR)_3 \qquad \text{(VI)}$$

wherein X represents a halogen atom and R represents a lower alkyl group, to produce a compound of the formula



(III)

reacting said Compound III with ammonia to produce a compound of the formula



(II)

and subjecting said Compound II to a ring-closure reaction. Compounds I are useful as tranquilizer or hypnotic agents or as intermediates for other medicines. Compounds III are novel products.

3,746,702

PREPARATIVE APPROACH TO 7-LOWER ALKANOYL BENZODIAZEPINES

Robert Ye-Fong Ning, West Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed May 4, 1970, Ser. No. 34,532
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD **8 Claims**

The present invention relates to a process for the preparation of 7-lower alkanoyl benzodiazepines.

3,746,703

2,6-DICHLOROBENZYLIDENEHYDRAZIDES

William F. Bruce, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 1, 1971, Ser. No. 159,056
Int. Cl. C07c *97/16*; C09b *23/00*
U.S. Cl. 260—562 H **16 Claims**

Novel derivatives of 2,6-dichlorobenzylidenehydrazides have been prepared which have useful pharmacological activity.

3,746,704

IMIDAZOLIDINONES

Willy D. Kollmeyer and Kurt H. G. Pilgram, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed May 19, 1971, Ser. No. 145,014
Int. Cl. C07d *49/32*
U.S. Cl. 260—240 F **1 Claim**

1-aralkylamino- and 1 - aralkylideneamino-2-imidazolidinones, and derivatives thereof, such as 1-[(3-trifluoromethyl)benzylideneamino]-2-imidazolidinone, are used as herbicides.

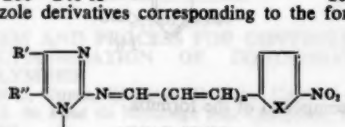
3,746,705

AMINOIMIDAZOLE DERIVATIVES

Bruno Cavalleri, Milan, and Giancarlo Lancini, Pavia, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,728
Claims priority, application Italy, Nov. 20, 1970, 31,972/70
Int. Cl. C07d *49/36, 63/12*
U.S. Cl. 260—240 A **10 Claims**

Imidazole derivatives corresponding to the formula



and their mineral acid salts wherein R represents hydrogen, lower alkyl, lower hydroxyalkyl, or lower halogenoalkyl; R' represents hydrogen or phenyl; R'' represents hydrogen, lower alkyl, lower hydroxyalkyl, lower halogenoalkyl or phenyl; X represents O or S; and *n* is 0 or 1 are claimed. They are prepared by reacting (1) a corresponding aminoimidazole with (2) a nitrofurancarboxaldehyde, a nitrothiophenecarboxaldehyde or their vinylogs. The novel compounds have antimicrobial activity.

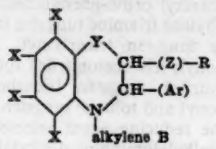
3,746,706

ANTIINFLAMMATORY AGENTS

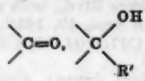
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 871,976, Oct. 28, 1969. This application May 7, 1970, Ser. No. 35,590
Int. Cl. C07d *93/12*
U.S. Cl. 260—240 F **19 Claims**

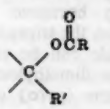
Antiinflammatory agents of the formula



wherein X is hydrogen, halogen, alkyl, haloalkyl, alkoxy, hydroxy, alkylthio, nitro, alkylsulfonyl, amino, alkanoylamino, or mono- or dialkylamino wherein any of the foregoing alkyl or substituted alkyl radicals contain up to 8 carbon atoms; Y is —O—, —S—, —CH_2—, —CH_2CH_2—, —SO—, —SO_2—, or Y may be absent entirely; R is alkyl of up to 8 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, aryl of up to 10 carbon atoms or aralkyl of up to 10 carbon atoms; Z is



wherein R' is hydrogen, vinyl, allyl or R, or



Ar is a mono- or bicyclic aryl radical selected from the group consisting of phenyl, X-substituted phenyl, alkylenedioxyphenyl, pyridyl, furyl, naphthyl or thienyl; alkylene is a straight or branched carbon chain of up to 6 carbon atoms, B is a basic nitrogen containing radical; and pharmaceutically acceptable acid-addition or quaternary ammonium salts thereof. These compounds are obtained by a novel rearrangement of an aryl substituted benzothiazinone and related compounds wherein Y is as defined above.

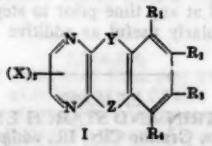
3,746,707

TRICYCLIC PYRAZINO COMPOUNDS AND METHOD FOR PREPARING THE SAME

Aylin H. Gulbenk, Walnut Creek, Dorothy J. Horne, Piedmont, and Howard Johnston, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Feb. 2, 1970, Ser. No. 9,260, now Patent No. 3,663,543. Divided and this application Sept. 30, 1971, Ser. No. 185,355
Int. Cl. C07d *51/62*
U.S. Cl. 260—243 AN **4 Claims**

Halogenated, tricyclic pyrazino compounds having the general structure:



wherein the X's independently, in each occurrence, represent hydrogen or halogen, Y and Z independently are —S—, —O— or

(where R is hydrogen or alkyl), and R_1, R_2, R_3 and R_4 are independently hydrogen, alkyl or halogen. Said compounds are prepared by reacting the appropriate polyhalopyrazine compound with a benzene compound which is ortho-substituted by two groups selected from hydroxy, mercapto and/or amino radicals. The compounds are variously useful as pesticides for the control of plant, insect and other organisms.

3,746,708

N-(MORPHOLINOALKYL) - 2 - INDENECARBOXAMIDES AND METHODS OF PREPARING THE SAME

William Blythe Wright, Jr., Woodcliff Lake, N.J., and Herbert Joseph Brabander, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 8,091, Feb. 2, 1970. This application Oct. 15, 1971, Ser. No. 189,736

Int. Cl. C07d *87/42*

U.S. Cl. 260—247.2 A **4 Claims**

The preparation of N-(morpholinoalkyl) derivatives of substituted or unsubstituted 2-indenecarboxamides, is described. The compounds are prepared by several methods, the preferred method being the reaction of a substituted or unsubstituted indenecarboxylic acid with N,N'-carbonyldiimidazole and subsequently with a substituted alkylenediamine. These compounds are useful primarily for their depressant and analgesic activity.

3,746,709

HEXAHYDROTRIAZINE ADDUCTS AS CO-CATALYSTS FOR THE PREPARATION OF FOAMS CHARACTERIZED BY CARBODIIMIDE LINKAGES

John T. Patton, Jr., Wyandotte, Moses Cenker, Trenton, and Peter T. Kan, Plymouth, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,567

Int. Cl. C07d *55/14*

U.S. Cl. 260—248 NS **5 Claims**

The adduct of 1,3,5-tris(3-dimethylaminopropyl)-s-hexahydrotriazine, an alkylene oxide and water has been found to be extremely active as a co-catalyst useful in the preparation of rigid cellular plastics characterized by carbodiimide linkages.

3,746,710

2-ALKYLTHIO-4,6-DI(ALKYLAMINO)-s-TRIAZINES

Manfred Kuhne, 11 Allemannenweg, Pfeffingen, Basel-Land, Switzerland, and Christian Vogel, 23 Leimgrubenweg, Binningen, Basel-Land, Switzerland

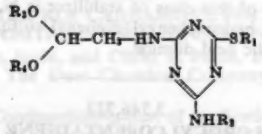
No Drawing. Filed Aug. 16, 1971, Ser. No. 172,263

Claims priority, application Switzerland, Aug. 20, 1970, 12,486/70

Int. Cl. C07d *55/20*

U.S. Cl. 260—249.8 **7 Claims**

New 2-alkylthio-4,6-alkylamino-s-triazines of the formula



(I)

wherein:

R_1 represents the methyl or ethyl radical,

R_2 represents an optionally cyano-substituted alkyl radical having 1 to 4 carbon atoms, or a cycloalkyl radical having 3 to 5 carbon atoms,

R_3 and R_4 each represent, independently of each other, a lower alkyl radical, or together represent the ethylene group with the formation of a dioxolane ring,

are described with processes for their production. These new compounds are used for the control of mono- and dicotyledonous weeds.

3,746,711

PREPARATION OF PYRAZINE DERIVATIVES

Laurence Sydney Payne, Ashford, Peter Ward, Aldington, near Ashford, and Reginald David Wells, Sellindge, near Ashford, England, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Dec. 14, 1970, Ser. No. 98,176

Int. Cl. C07d *51/76*

U.S. Cl. 260—250 R **5 Claims**

A process for the preparation of various nuclear substituted pyrazines comprises reacting pyrazine, a C_1–C_{10} alkyl pyrazine, a C_1–C_5 alkoxy pyrazine or an aminopyrazine with an alkylating agent in the optional presence of an inert solvent. The alkylating agent can be a ketone, an aldehyde or imino derivative thereof or an alkyl-, cycloalkyl- or arylhalide. The source of "free" electrons is preferably either lithium, sodium or potassium. The nuclear substituted pyrazines obtained possess strong characteristic odours. Certain of these compounds are of value as flavouring agents while others are of use in imparting characteristic notes to perfume formulations.

3,746,712

6-(SUBSTITUTED-PHENYL)-5-METHYL-4,5-DIHYDRO-3(2H)-PYRIDAZINONES

Adma Schneller Ross, 65 Campbell Ave., Suffern, N.Y. 10901, and William Vincent Curran, 27 Harding St., Pearl River, N.Y. 10965

No Drawing. Filed June 8, 1971, Ser. No. 151,154

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **10 Claims**

This disclosure describes compounds of the class of 6-(substituted-phenyl) - 5 - methyl - 4,5 - dihydro-3(2H)-pyridazinones useful as hypotensive agents.

3,746,713

S-(1 - METHYL - 2 - OXO-4-THIOPYRIMIDINYL-3-METHYL)-O,O-DIMETHYLPHOSPHOROTHIOATE

Martin L. Gorbaty, Fanwood, N.J., assignor to Esso Research & Engineering Co., Linden, N.J.

No Drawing. Filed June 29, 1971, Ser. No. 158,099

Int. Cl. C07d *51/38*

U.S. Cl. 260—251 P **1 Claim**

S-[1-methyl-2-oxo - 4 - thiopyrimidinyl-3-methyl]-O,O-dimethylphosphorothioate as a biologically active compound of exceptional pesticidal activity.

3,746,714

METHODS FOR INHIBITING AGGRESSIVE BEHAVIOR BY MEANS OF s-TRIAZOLO-[3,4-a]-ISOQUINOLINES

Morton E. Goldberg, Glen Rock, N.J., assignor to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed Oct. 6, 1971, Ser. No. 187,175

Int. Cl. A61u *27/00*

U.S. Cl. 424—258 **5 Claims**

Certain s-triazolo-[3,4-a]-isoquinoline compounds are shown to exhibit anti-agressive activity. The 8,9-dimethoxy and 3-methyl-8,9-dimethoxy derivatives are preferred.

3,746,715

N-SUBSTITUTED-5,6,7,8-TETRAHYDRO-7-METHYLNAPHTHO-[2,3-d]-1,3-DIOXOLE - 5,6-DICARBOXIMIDES

William F. Bruce, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 1, 1971, Ser. No. 159,058

Int. Cl. C07d *99/04*

U.S. Cl. 260—293.58 **17 Claims**

This invention discloses N-substituted-5,6,7,8-tetrahydro-7-methylnaphtho[2,3-*d*]-1,3-dioxole - 5,6 - dicarboximides and derivatives thereof including acid addition salts and quaternary ammonium compounds. The compounds have utility as central nervous system depressants useful in the calming of animals.

3,746,716

2-BENZYLAMINO - 5 - (5-BROMO - 2 - METHOXYPHENLY)-1,3,4-THIADIAZOLE AND CONGENERS

Robert C. Tweit, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,435

Int. Cl. C07d *91/62*

U.S. Cl. 260—306.8 D 5 Claims

Preparation of 2 - phenylalkylamino - 5 - (substituted phenyl)-1,3,4-thiadiazoles wherein the 5 - phenyl substituents are halogen and/or alkoxy, and the useful biological properties of these thiadiazoles including antihypertensive, antiulcerogenic, and antiprotozoal activity, are disclosed.

3,746,717

CERTAIN 2,4-THIAZOLIDINEDIONE-2-THIOSEMICARBAZONES

Alex Meisels, Basel, and Emilio Schott, Riehen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Application Oct. 1, 1969, Ser. No. 862,936, which is a continuation-in-part of application Ser. No. 587,996, Oct. 20, 1966. Divided and this application Oct. 5, 1971, Ser. No. 186,808

Claims priority, application Switzerland, Oct. 29, 1965, 14,985/65

Int. Cl. C07d *11/18*

U.S. Cl. 260—306.7 12 Claims

2,2'-azines of 2,4-thiazolidinediones are useful for the inhibition of the growth of tumors. An illustrative embodiment is the 2,2'-azine of 3,5-dimethyl-2,4-thiazolidinedione and 3-(2 - methylallyl) - 2,4 - thiazolidinedione. 2,4-thiazolidinedione-2-(3-thiosemicarbazones) are useful as intermediates in their production.

3,746,718

PURIFICATION OF TETRAMISOLE

Volker Elmar Maier, Hampton, Victoria, Australia, assignor to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia

No Drawing. Filed June 3, 1971, Ser. No. 149,840

Claims priority, application Australia, July 2, 1970, 1,704/70

Int. Cl. C07d *99/10*

U.S. Cl. 260—306.7 8 Claims

A process of purifying tetramisole containing as an impurity trans-2-imino-3-styryl thiazolidine which process comprises adding to an aqueous solution of a tetramisole salt a sufficiency of a water soluble salt of phthalic acid, precipitating at least part of the said impurity, removing the precipitated impurity from the aqueous phase by phase separation and recovering the purified tetramisole.

3,746,719

4-SUBSTITUTED 2-AMINO-1,3,4-THIADIAZOLONES-(5) AND PROCESS FOR THEIR PREPARATION

Klaus Sasse, Schildgen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

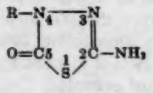
No Drawing. Filed Oct. 15, 1970, Ser. No. 81,119

Claims priority, application Germany, Oct. 25, 1969, P 19 53 811.5

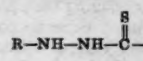
Int. Cl. C07d *91/60*

U.S. Cl. 260—306.8 D 24 Claims

4-substituted 2-amino-1,3,4-thiadiazolones of the formula



are prepared by reacting the corresponding 1-substituted thiosemicarbazide of the formula



with phosgene, in the presence of water. Novel compounds are produced thereby.

3,746,720

1-(5')-PHTHALIDYL-3-PHENYLPYRAZOLINES

Peter Stuart Littlewood, Ilkley, England, assignor to Sandoz Ltd., Basel, Switzerland

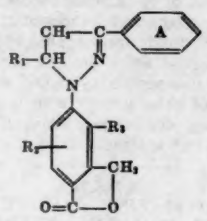
No Drawing. Filed Nov. 13, 1970, Ser. No. 89,493

Claims priority, application Switzerland, Nov. 21, 1969, 17,350/69; July 3, 1970, 10,093/70

Int. Cl. C07d *49/10*

U.S. Cl. 260—310 D 7 Claims

Pyrazoline compounds of formula



(I)

wherein

R_1 is hydrogen, alkyl or aryl,
R_2 is hydrogen, halogen or alkyl,
R_3 is hydrogen, halogen or alkyl,

and the nucleus A may bear substituents such as halogen, alkyl, alkoxy, acylamino or substituted triazinylamino and alkyl, aryl, alkoxy and acylamino may be substituted which are useful as optical brighteners.

3,746,721

AROMATIC DIIMIDES OF 3,5-DIALKYL-4-HYDROXYPHENYLSUBSTITUTED AMINES

John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,463

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 S 7 Claims

Aromatic diimides of 3,5-dialkyl-4-hydroxyphenyl-substituted amines of this invention effectively stabilize organic materials against the effects of heat and oxygen. The diimides of this invention are prepared by reacting the appropriate 3,5-dialkyl-4-hydroxyphenylsubstituted amine with an aromatic dianhydride or aromatic diimide. An example of this class of stabilizer is N,N'-bis(3,5-di-t-butyl - 4 - hydroxybenzyl)diphenyl sulfone - 3,4,3',4'-tetracarboxylic acid diimide.

3,746,722

HEXACHLOROCYLCOPENTADIENE ADDUCTS OF UNSATURATED AMIDES

Robert R. Mod, Frank C. Magne, and Evald L. Skau, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Nov. 21, 1969, Ser. No. 878,922, now Patent No. 3,663,582. Divided and this application Dec. 16, 1971, Ser. No. 208,956

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.5 E 1 Claim

This invention relates to certain new nitrogen-containing compounds, more particularly to N-substituted and

N,N-disubstituted amides, the acyl moieties of which are the acyl moieties of the hexachlorocyclopentadiene adducts of either 9-octadecenoic or 10-undecenoic acids.

The compounds which are the subject of this invention are characterized by the fact that as growth inhibitors they are effective against a variety of bacteria, yeasts, and molds, some of which are pathogenic. They are also useful as plasticizers.

3,746,723

PROCESS FOR THE PRODUCTION OF ALKYLENE SULFIDE

Hitoshi Nakajima, 2716 Kawarabuki Ageo-shi, Saitama-Prefecture, Japan, and Masazumi Chono, 2632 Shiki Adachi-machi, Kitaadachi-gun, Saitama-Prefecture, Japan

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,347
Claims priority, application Japan, Jan. 21, 1970, 45/5,043
Int. Cl. C07d *59/00*
U.S. Cl. 260—327 E 5 Claims

An economically attractive process for the industrial production of alkylene sulfide is provided. The catalytic reaction of an olefinic hydrocarbon with hydrogen sulfide and oxygen is performed in a gas phase.

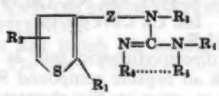
3,746,724

3-GUANIDINOALKYL-THIOPHENES

Lincoln Harvey Werner, Summit, and Neville Finch, West Orange, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 28,029, Apr. 13, 1970. This application Jan. 26, 1971, Ser. No. 109,957
Int. Cl. A61k *27/00;* C07d *65/12*
U.S. Cl. 260—329 AM 6 Claims

3-guanidinoalkyl-thiophenes, e.g. those of the formula



$R_{1,2}$=H, alkyl or halogen
$R_{3,4}$=H or alkyl
$R_{5,6}$=H, alkyl or alkylene
Z is a straight or branched alkylene of up to 4 carbon atoms.

and salts thereof are antihypertensives.

3,746,725

WATER-SOLUBLE CARBAMOYL POLYMER COMPOSITIONS USED AS CEMENTS

Louis H. Eilers, Inola, and Christ F. Parks, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 17,290, Mar. 6, 1970, which is a continuation of application Ser. No. 486,530, Sept. 10, 1965. This application July 12, 1971, Ser. No. 161,875
Int. Cl. C08g *51/34*
U.S. Cl. 260—33.4 R 7 Claims

The sealing of void spaces, e.g. as in geological formations and/or between metal shapes is accomplished with a liquid slurry of a particulate, water-soluble organic polymer in an organo solvent. The mixture of the polymer and solvent has a controlled set time to allow the emplacement of the slurry as a liquid. The slurry then sets to form a sealing cementitious material.

3,746,726

BROMINATING BUTYNE-(2)-DIOL-(1,4)

Franz Reicheneder, Ludwigshafen (Rhine), and Karl Dury, deceased, late of Kirchheimbolanden, by Johanna Maria Dury, heiress-at-law, Kirchheimbolanden, and Georg Krusche and Heinz Burger, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Continuation of application Ser. No. 528,782, Feb. 21, 1966. This application Feb. 28, 1969, Ser. No. 805,999
Claims priority, application Germany, Feb. 25, 1965, P 12 77 244.0-42
Int. Cl. C07d *5/04;* C07c *31/20;* C08k *6/24*
U.S. Cl. 260—347.8 2 Claims

A process for brominating butyne-(2)-diol-(1,4) in which said compound is reacted with elementary bromine in an aqueous or aqueous-mineral acid medium at a temperature of —40° C. to 150° C. The reaction can take place either in the presence of catalysts or in the absence of catalysts. The molar ratio of bromine to butyne-(2)-diol-(1,4) used in the reaction can range from 1:1 to 20:1. The process is used to produce 23-dibromobutene-(2) - diol - (1,4), 2,2,3,3 - tetrabromobutanediol-(1,4), mucobromic acid or 2 - hydroxy - 3,3,4,4 - tetrabromotetrahydrofuran. The invention also is directed to the novel compound 2 - hydroxy-3,3,4,4-tetrabromotetrahydrofuran.

3,746,727

BENZENESULFHYDROXAMIC ACIDS AND THEIR DERIVATIVES

Kurt H. G. Pilgram and Richard D. Skiles, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed June 7, 1971, Ser. No. 150,715
Int. Cl. C07c *143/82*
U.S. Cl. 260—397.7 2 Claims

Certain novel ring-substituted benzenesulfhydroxamic acids and esters, useful as herbicides.

3,746,728

PHOSPHATIDE DERIVATIVES OF PROSTAGLANDINS

Maxwell Gordon, Syracuse, N.Y., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Jan. 5, 1968, Ser. No. 695,832. Divided and this application Sept. 10, 1971, Ser. No. 179,566
Int. Cl. C07f *9/02, 9/10*
U.S. Cl. 260—403 5 Claims

The half life of prostaglandins in the blood is prolonged by administering the prostaglandin as a glyceride or phosphatide derivative. The glyceride and phosphatide derivatives of prostaglandins are prepared (1) by reacting a glycerol or glycerophosphoric acid compound with a prostenoic acid which has hydroxy groups protected and then removing the hydroxy-protecting groups or (2) biosynthetically by reacting a prostenoic acid with a glycerol or glycerophosphoric acid compound.

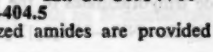
3,746,729

NITROKETONIZED AMIDES AND THEIR METHOD OF PREPARATION

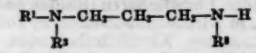
Donald R. Lachowicz, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 24, 1970, Ser. No. 101,407
Int. Cl. C09f *7/00*
U.S. Cl. 260—404.5 13 Claims

Nitroketonized amides are provided corresponding to the formula:



where R, R' or R'' is a nitroketonized group and is prepared by contacting an amide represented by the formula:



where at least one of the groups R^1, R^2 or R^3 is an alkenyl or alkenoyl, with a combination of oxygen and dinitrogen tetroxide such that unsaturated portions of the amide are converted to vicinal nitroketone groups. The novel compounds have utility as gasoline additives in that they provide motor fuel compositions with such properties as rust protection, carburetor de-icing and carburetor detergency.

3,746,730

PROCESS FOR THE MANUFACTURE OF POLYENE ACIDS

Roman Marbet, Riehen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Dec. 17, 1970, Ser. No. 99,273
Claims priority, application Switzerland, Dec. 31, 1969, 19,399/69
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 26 Claims

A process for preparing polyene acids from polyene alcohols or esters thereof by a single oxidation reaction by silver(I)oxide in the presence of an alkali.

3,746,731

PROCESS FOR REFINING GLYCERIDE OILS AND FATS

Esmond J. Keating, New Orleans, La., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,715
Int. Cl. C09f *5/02*
U.S. Cl. 260—426 8 Claims

This invention relates to the purification of crude glyceride oils or fats usually with alkaline reagents for the purpose of clarifying and conditioning the oils or fats for various end uses, usually edible products. The process is commonly known as "refining."

3,746,732

SYNTHESIS OF SILYLMETALLIC COMPLEXES

William H. Atwell and Gary N. Bokerman, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Dec. 15, 1971, Ser. No. 208,414
Int. Cl. C07b *15/00*
U.S. Cl. 260—429 R 8 Claims

Silyl complexes of platinum and palladium are prepared by reacting below 150° C. disilanes or hydrosilanes with phosphine complexes of the formula $M(PR'_3)_2Y_2$. Specifically hexachlorodisilane is reacted with

$$Pd\{PPhMe_2\}_2Cl_2$$

to give $Pd\{PPhMe_2\}_2(SiCl_3)Cl$ and/or

$$Pd\{PPhMe_2\}_2(SiCl_3)_2.$$

3,746,733

COBALT II HALIDE HYDRAZINE COMPLEXES

Christian H. Stapfer, Stoney Brook Road, Newtown, Pa. 18940, and Richard W. D'Andrea, Rownsberg Road, New Hope, Pa. 18938

No Drawing. Original application Apr. 6, 1970, Ser. No. 26,161. Divided and this application Sept. 16, 1971, Ser. No. 181,215
Int. Cl. C07f *15/06*
U.S. Cl. 260—439 R 11 Claims

Cobalt (II) halide trihydrazinates of the formula

$$[Co(II)(R—NH—NH_2)_3]X_2$$

are prepared as well as cobalt (II) halide tris(hydrazine hydrochloride) complexes of the formula

$$[Co(II)(N_2H_4 \cdot HX)_3]X_2$$

where R is H, alkyl, aryl, haloaryl and X is halogen. The compounds are useful as driers for alkyd resins and to accelerate the oxidative polymerization of olefinic polymer systems, particularly unsaturated polyesters, in conjunction with organic peroxides and as promoters for ketone aldol condensation. Known Co II complexes of the formula $[Co(II)(R—NH—NH_2)_2]X_2$ also have these same uses.

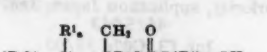
3,746,734

ACRYLATE OR METHACRYLATE SILANES

Abe Berger and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

No Drawing. Filed Feb. 4, 1972, Ser. No. 223,701
Int. Cl. C07f *7/08, 7/18*
U.S. Cl. 260—448.2 B 20 Claims

Acryloxy or methacryloxy substituted silicone compound of the formula:



wherein R is H or is a monovalent organic radical free of non-benzenoid unsaturation; R^1 is halogen or a monovalent hydrocarbon radical free of non-benzenoid unsaturation; R^2 is a divalent hydrocarbon radical; R^3 is H or CH_3; a is a whole number integer from 0 to 3 inclusive; isomeric mixtures thereof; and process of preparation are provided.

3,746,735

ADDITIONAL REACTION INVOLVING DIPEROXYFUMARATE AND COMPOUNDS HAVING DIPEROXYSUCCINYL GROUPS

Richard Anthony Bafford, 456 Forbes Ave., Tonawanda, N.Y. 14151; Ernest Rudolph Kamens, 52 Rano St., Buffalo, N.Y. 14207; and Orville Leonard Mageli, 81 Danbury Lane, Kenmore, N.Y. 14217

No Drawing. Original application Mar. 8, 1968, Ser. No. 711,502, now Patent No. 3,592,948. Divided and this application Apr. 2, 1971, Ser. No. 130,794
Int. Cl. C07c *69/00*
U.S. Cl. 260—453 R 9 Claims

A diester of diperoxyfumaric acid is reacted at its double bond with an organic compound R—(X), where X is a monovalent atom readily abstractable by a free radical, e.g., hydrogen, chlorine or bromine, and R is inert to the peroxycarbonyl groups of the diperoxyfumarate to form an addition product including at least one diester of a substituted diperoxysuccinic acid. For example: Tetrahydrofuran and di-t-butyl diperoxyfumarate react at about 0° C. to form di-t-butyl alpha-(2-tetrahydrofuryl)diperoxysuccinate. Polyglycols and polyvinyl ethers, alcohols, halides, etc. react to give polymers having pendant pairs of peroxycarbonyl ester groups in gamma relationship to each other.

These compounds are of especial interest in the preparation of block and graft copolymers.

3,746,736

PROCESS FOR PREPARING ALPHA, BETA, UNSATURATED CARBONYL COMPOUNDS

Shinzaburo Sumimoto and Akira Takase, Osaka Prefecture, Japan assignors to Shionogi & Co., Ltd., Osaka, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 796,162, Feb. 3, 1969. This application Mar. 19, 1971, Ser. No. 126,279
Claims priority, application Japan, Feb. 19, 1968, 43/10,688, 43/10,689
Int. Cl. C07c *69/00, 69/66*
U.S. Cl. 260—463 6 Claims

Cis and trans isomers of α,β-unsaturated carbonyl compounds are separately obtained in a controlled output

ratio by the reactions of active methylene compounds which are likely to be enolized with pyrocarbonate esters. Furthermore, pure cis isomers of said α,β-unsaturated carbonyl compounds are obtained by decomposing trans isomers in the mixtures of isomers by the action of aliphatic secondary amines, preferably, diisobutylamine.

3,746,737

AMMOXIDATION OF SATURATED HYDROCARBONS

Gerald M. Tullman, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,634
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 4 Claims

Acrylonitrile and methacrylonitrile are prepared in a vapor phase process which comprises reacting propane or isobutane, ammonia and oxygen in the presence of a catalyst consisting essentially of, as the essential catalytic ingredients, cerium and molybdenum, and said metals being present in the form of oxides or of a complex with oxygen or mixtures thereof.

3,746,738

SILICON CONTAINING POLYAZIMIDES

Enrico J. Pepe and James G. Marsden, Amawalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Mar. 28, 1972, Ser. No. 238,973
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 E 10 Claims

Polyazamides containing silicon moieties in the polymer backbone and/or pendant therefrom which are useful as fiber sizers, surfactants, coupling agents, and the like.

3,746,739

CARBAMATE ESTERS OF DICHLORO-NITRO-ALKOXY- AND DICHLORO-NITRO-HYDROXY-ALKOXY-PHENOLS

R. Garth Pews and Ralph M. Rodia, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 2, 1970, Ser. No. 77,705
Int. Cl. C07c *125/06*
U.S. Cl. 260—468 E 8 Claims

Novel carbamate esters of dichloro-nitro-alkoxy- and dichloro-nitro-hydroxyalkoxy-phenols are prepared by the reaction of a substituted isocyanate compound with a dichloro-nitro-alkoxy- or dichloro-nitro-hydroxyalkoxyphenol compound in the presence of an inert carrier as a reaction medium at a temperature of from about 0 to about 100° C. The novel compounds are suitable for use as fungicides and as the active agents in fungicidal compositions.

3,746,740

ESTERS OF 9-FLUORENE CARBOXYLIC ACID AND DERIVATIVES THEREOF

Gunther Mohr and Dietrich Erdmann, Darmstadt, Konrad Niethammer, Traisa, and Siegmund Lust and Gerhart Schneider, Darmstadt, Germany, assignors to E. Merck A.G., Darmstadt, Germany

No Drawing. Original application Nov. 19, 1965, Ser. No. 508,835, now Patent No. 3,476,545, dated Nov. 4, 1969. Divided and this application Oct. 15, 1969, Ser. No. 870,927
Claims priority, application Germany, Nov. 27, 1964, M 63,287; Mar. 13, 1965, M 64,518
Int. Cl. C07c *69/76*
U.S. Cl. 260—469 10 Claims

Esters of 9-fluorene carboxylic acid and derivatives thereof useful for regulating plant growth.

3,746,741

PHENOXYACETIC ACID DERIVATIVES

Adolf Hubele, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Oct. 27, 1969, Ser. No. 869,913
Claims priority, application Switzerland, Nov. 1, 1969, 16,334/69
Int. Cl. C07c *127/16*
U.S. Cl. 260—471 R 5 Claims

Derivatives of p-carbamoylamino-phenoxycarboxylic acids such as salts, ester or amides are very effective in plant-influencing, as selective herbicides, defoliants or growth regulators. They may be used in pesticidal preparations.

3,746,742

POLYGLYCOL-ETHYLENE-IMINE DERIVATIVES

Erich Schuierer and Dieter Hoffmann, Burghausen, and Siegfried Rebsdat, Altotting, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 26, 1970, Ser. No. 67,277
Claims priority, application Germany, Sept. 17, 1969, P 19 46 955.7
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C 3 Claims

Polyadducts are obtained when treating methanes having ethylene-imine rings and a polyether chain or a fluoroalkyl chain with acidic compounds. The polyadducts are textile finishing agents rendering textiles hydrophobic and oleophobic and achieve the so-called soil-release effect.

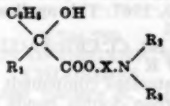
3,746,743

2 - (ETHYLPROPYLAMINE)ETHYL-α,α-DIPHENYL-GLYCOLLATE AND THE HYDROCHLORIDE THEREOF

Minoo Dossabhoy Mehta, Wimbledon, and John Graham Bainbridge, Betchworth, England, assignors to Beecham Group Limited

No Drawing. Continuation of application Ser. No. 732,517, May 28, 1968, which is a continuation-in-part of application Ser. No. 390,173, Aug. 17, 1964, both now abandoned. This application Oct. 7, 1971, Ser. No. 187,558
Claims priority, application Great Britain, Aug. 22, 1963, 33,248/63
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 A 2 Claims

New basic esters are provided which are useful in the palliative treatment of Parkinsonism. The new esters have the formula:



(I)

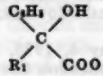
wherein

R_1 is phenyl or cyclohexyl,

R_2 and R_3 are different lower alkyl groups of 1 to 6 carbon atoms, and

X is divalent alkylene of 2 or 3 carbon atoms,

and non-toxic pharmaceutically acceptable acid addition salts thereof, and are produced from a substituted acetic acid ester of the formula:



(II)

which is reacted with an N-disubstituted aminoalcohol of the formula:

(III)

wherein R_1, R_2, R_3 and X have the above meanings, to produce the new and useful compounds of Formula I.

3,746,744
PROCESS FOR THE MANUFACTURE OF ESTERS OF DICARBOXYLIC ACID
John C. Reid, Jr., Wynnewood, Pa., assignor to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Mar. 25, 1971, Ser. No. 128,197
Int. Cl. C07c *69/80*
U.S. Cl. 260—475 P 11 Claims

A process for producing bis-esters of a dicarboxylic acid by reacting the dicarboxylic acid with an alkylene oxide in the presence of a high molecular weight nitrogen-containing polymer as catalyst.

3,746,745
SYNTHESIS OF HEXAMETHYL MELLITATE
Robert J. Crawford, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 31, 1971, Ser. No. 130,023
Int. Cl. C07c *69/76*
U.S. Cl. 260—475 R 8 Claims

An improved process for synthesizing the hexamethyl ester of mellitic acid by the trimerization of dimethyl acetylenedicarboxylate which maximizes product yield and minimizes costly reaction time and need for expensive equipment.

3,746,746
METHOD OF PREPARING ORGANIC ISOCYANATES
Angelo S. Pagano, Doylestown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Original application June 27, 1968, Ser. No. 740,479. Divided and this application Mar. 1, 1971, Ser. No. 120,047
Int. Cl. C07c *119/04*
U.S. Cl. 260—478 5 Claims

Isocyanates are prepared from their corresponding amines or amino-containing compounds in a phosgenation reaction, employing a small but catalytically effective amount of an N,N-dialkyl amide catalyst.

3,746,747
PRODUCTION OF OXYGENATED ORGANIC COMPOUNDS
Donald G. Kuper and William B. Hughes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
No Drawing. Continuation-in-part of application Ser. No. 652,042, July 10, 1967. This application Jan. 26, 1971, Ser. No. 109,971
Int. Cl. C07c *69/52*
U.S. Cl. 260—485 R 6 Claims

Olefinically unsaturated compounds containing at least two carbon to carbon double bonds in conjugation are converted to esters by contacting with carbon monoxide and an alcohol containing up to 3 hydroxyl groups in the presence of a bridged organo dirhodium complex catalyst. The esters produced have utility in the production of polymers.

3,746,748
INSECT CONTROL AGENTS
Josef Ratusky and Frantisek Sorm, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia
No Drawing. Filed May 4, 1970, Ser. No. 34,598
Claims priority, application Czechoslovakia, May 14, 1969, 3,415/69
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 12 Claims

Juvenile hormone insect control agents based on esters derived from unsaturated acids of the acrylic acid type. Chlorinated esters and epoxides of esters are also disclosed and are useful as insect control agents.

3,746,749
METHOD FOR PRODUCING CARBOXYLIC ACID UNSATURATED ESTERS
Tetsuo Mitsuyasu and Jiro Tsuji, Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan
No Drawing. Filed Aug. 10, 1970, Ser. No. 62,641
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A 10 Claims

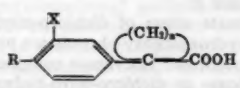
Producing a carboxylic acid unsaturated ester by reacting a conjugated diene and carboxylic acid in the presence of a palladium catalyst, with alkali carboxylate present in the reaction system.

3,746,750
SOLUBILIZATION OF ORGANIC ACIDS
Adin Lee Stautzenberger and Alexander Fiske MacLean, Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Continuation of application Ser. No. 564,541, July 12, 1966. This application June 19, 1970, Ser. No. 48,936
The portion of the term of the patent subsequent to Nov. 23, 1988, has been disclaimed
Int. Cl. C07c *51/42, 63/54*
U.S. Cl. 260—514 K 11 Claims

Process for purifying relatively insoluble acids such as terephthalic by forming a solution of the acid in an aqueous solution of weak acid salts of lithium, tertiary amines, or tertiary alkyl ammonium compounds, followed by treating the solution to reduce impurities present and recrystallization of the purified acid from solution.

3,746,751
1-(3-CHLORO-4-CYCLOALKYLPHENYL)-CYCLOALKYL-1-CARBOXYLIC ACIDS
Shunsaku Noguchi, Minoo, Osaka, Mikihiko Obayashi, Suita, Osaka, Isao Minamida, Kyoto, Shoji Kishimoto, Suita, Osaka, and Kiyohisa Kawai, Kyoto, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed July 3, 1969, Ser. No. 839,065
Claims priority, application Japan, July 4, 1968, 43/46,771; Jan. 13, 1969, 44/2,507; Jan. 18, 1969, 44/3,658
Int. Cl. C07c *63/00, 121/60;* A61k *27/00*
U.S. Cl. 260—515 A 6 Claims

Compounds of the formula



wherein X is hydrogen or halogen, R is an alkyl group of 3–6 carbons and *n* is an integer of 2 to 5 and their pharmaceutical acceptable salts are provided herein. These compounds have excellent anti-inflammatory, analgesic and antipyretic properties and low toxicity.

3,746,752
PROCESS FOR PREPARATION OF AROMATIC CARBOXYLATES
Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Oct. 18, 1971, Ser. No. 190,285
Int. Cl. C07c *63/14, 63/26, 63/34*
U.S. Cl. 260—515 P 8 Claims

An alkali metal salt of an aromatic carboxylic acid is recrystallized from a water solution in the presence of an organic compound selected from the group consisting of alcohols, esters and ketones. The recrystallized salt is thereafter utilized in a disproportionation process wherein the alkali metal salt is converted to an aromatic polycarboxylate containing at least one additional carboxylate group.

3,746,753

α-HYDRAZINO-β-PHENYL ALKANOIC ACIDS AND THEIR DERIVATIVES

Sandor Karady, Elizabeth, Seemon H. Pines, Murray Hill, Manuel G. Ly, Edison, and Meyer Sletzinger, North Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 24, 1970, Ser. No. 49,512
Claims priority, application Canada, Mar. 25, 1970, 78,423
Int. Cl. C07c *109/04*
U.S. Cl. 260—519 2 Claims

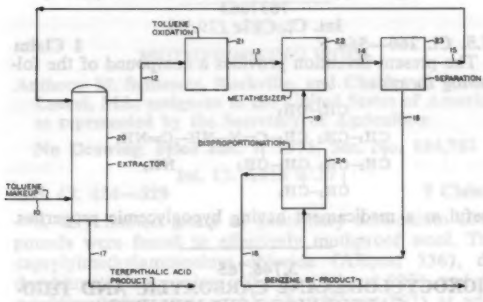
A new method of preparing L-α-hydrazino-β-phenyl-alkanoic acids and their derivatives by reduction of various novel intermediate compounds is disclosed. The preparation of these novel intermediate compounds is also described.

3,746,754

TEREPHTHALIC ACID PRODUCTION

Martin R. Cines, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 26, 1971, Ser. No. 109,911
Int. Cl. C07c *51/42, 63/02*
U.S. Cl. 260—524 R 4 Claims



In the production of terephthalic acid by toluene oxidation to benzoic acid followed by conversion of benzoic acid to terephthalic acid, the terephthalic acid is purified of benzoic acid by extraction with toluene and passing the toluene-benzoic acid extract directly to the toluene oxidation step.

3,746,755

PURIFICATION OF POLYBASIC ACIDS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Jan. 25, 1971, Ser. No. 109,604
Int. Cl. C07c *51/42, 55/20*
U.S. Cl. 260—525 9 Claims

Polybasic acids which contain impurities which are present due to the method of manufacturing said acids are removed by treating a polybasic acid with a substituted urea.

3,746,756

PROCESS FOR OZONIZING LOW MOLECULAR WEIGHT OLEFINS

Harold E. Mains and Herman F. Oehlschlaeger, Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

No Drawing. Filed Oct. 5, 1971, Ser. No. 186,792
Int. Cl. C07c *53/22, 55/22*
U.S. Cl. 260—533 R 5 Claims

The present invention relates to an improved process for ozonizing low molecular weight olefins wherein the dangers inherent with such a reaction due to the formation of potentially explosive ozonide fog are minimized. By the formation of an "ene" adduct with the olefin prior to reaction with ozone the ozonization of low molecular weight olefins may be safely conducted at temperatures significantly higher than has heretofore been possible.

3,746,757

PROCESS FOR MANUFACTURING 6-NITRO-2-OXIMINOHEXANOIC ACID DERIVATIVES

Ryoji Kikumoto, Kanagawa-ken, Japan, assignor to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed May 26, 1969, Ser. No. 827,550
Claims priority, application Japan, May 30, 1968, 43/36,934
Int. Cl. C07c *101/10*
U.S. Cl. 260—534 R 5 Claims

Novel compounds of 6-nitro-2-oximino-hexanoic acid and a salt, an ester and an amide thereof useful for intermediate in the lysine synthesis; and a process for manufacturing such compounds which comprises reacting 6-nitro-2-oximino-1-cyclohexene-1-ol with water together with a base selected from the group consisting of alkali and alkaline earth metal hydroxides, a salt of inorganic and organic acid having a dissociation constant less than 1.3×10^{-3} and alkali and alkaline earth metal, ammonia and primary, secondary and tertiary amines.

3,746,758

PHOSPHINE OXIDE AND PHOSPHONYL DICHLORIDES OF ALKYLATED p-HYDROXYPHENYL-ALKANES

John Denon Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 618,988, Feb. 27, 1967, which is a continuation-in-part of application Ser. No. 612,336, Jan. 30, 1967. This application Sept. 30, 1970, Ser. No. 77,034
Int. Cl. C07f *9/02, 9/34, 9/42*
U.S. Cl. 260—543 P 3 Claims

Phosphine oxides and phosphonyl dichlorides are prepared from alkylated p-hydroxyphenylalkyl halides and phosphorous halides in the presence of a complexing metal halide Lewis acid followed by dissociation of the reaction complex with water.

The phosphine oxides are useful as stabilizers of organic materials which are subject to oxidative deterioration.

The phosphonyl dichlorides are useful as intermediates in preparing the corresponding phosphonates which in turn are useful as stabilizers for organic materials which are subject to oxidative deterioration.

3,746,759

SEPARATION OF ORGANIC SULFONYL CHLORIDES

Carl D. Kennedy and Wallace R. Weaver, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,795
Int. Cl. C07c *143/20*
U.S. Cl. 260—543 R 11 Claims

The present invention relates to the preparation and purification of organic sulfonyl chlorides, and more particularly, to the separation of alkane sulfonyl chlorides produced in the combined reaction of sulfur dioxide and chlorine with a paraffin hydrocarbon compound into fractions of different polarity. By the present invention, the alkane sulfonyl chloride mixture, the mixture remaining after the extraction with a selective solvent or the extract mixture obtained is cooled to a temperature effective to cause the crystallization of more polar alkane sulfonyl chlorides contained therein. The crystalline material is separated from the remaining liquid fraction containing less polar alkane sulfonyl chlorides, and melted to obtain fractions containing more polar alkane sulfonyl chlorides.

3,746,760

N-MONOHALOMONOSUBSTITUTED UREAS

Chester Stephen Sheppard, Tonawanda, and Leonard Earnest Korczykowski, North Tonawanda, N.Y., assignors to Pennwalt Corporation

No Drawing. Continuation-in-part of application Ser. No. 409,306, Nov. 5, 1964. This application Nov. 21, 1967, Ser. No. 684,651

Int. Cl. C07c *127/14*

U.S. Cl. 260—543 A 11 Claims

A process for making N-monochloro or bromo monosubstituted urea where a urea RNH—CO—NH_2 is suspended in liquid water at 0° C.–60° C. and reacted with free chlorine or free bromine, at least 2 g. atoms per mole of urea, preferably in the presence of an acid acceptor such as zinc oxide; R may be alkyl having 3 carbon atoms, cycloalkyl, aralkyl, alkoxycarbonyl, aryloxycarbonyl or acyl.

New compounds of the formula R_d—NX—CO—NX'H where X and X' are different and are (1) chloro or bromo and (2) hydrogen and R_d is alkyl or cycloalkyl, 3–15 carbon atoms, or $R_1C(O)$—, where R_1 is aliphatic, cycloaliphatic, aryl, alkoxy or aryloxy, each of not more than 10 carbon atoms and when X is H, X' is Cl or Br and R_d is alkyl or cycloalkyl and when X is Cl or Br, X' is H and R_d is $R_1C(O)$—.

3,746,761

ADAMANTANOPYRIMIDINE COMPOUNDS AND INTERMEDIATES THEREFOR

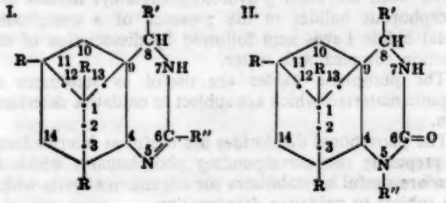
Jiban Kumar Chakrabarti, Frimley, and Stephen Slomo Szinai, Workingham, England, assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Original application May 1, 1969, Ser. No. 821,063, now Patent No. 3,644,356. Divided and this application Apr. 5, 1971, Ser. No. 131,439

Int. Cl. C07c *61/36*

U.S. Cl. 260—544 L 2 Claims

Adamantanopyrimidine compounds of the formulae:



useful as analgesics and as local anaesthetics; and intermediates useful in the synthesis of the foregoing adamantanopyrimidine compounds.

3,746,762

TRIFLUOROMETHYL SUBSTITUTED BENZANILIDES

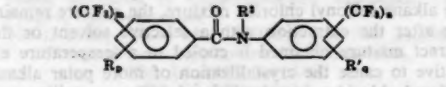
Paul J. Stoffel, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 57,789, July 23, 1970. This application Dec. 23, 1971, Ser. No. 211,715

Int. Cl. C07c *103/30*

U.S. Cl. 260—558 P 5 Claims

Compounds of the formula



wherein *m* and *n* are integers from 1 to 2, inclusive, *p* and *q* are integers from 0 to 2, inclusive, R and R' are halo or nitro, and R^3 is hydrogen or formyl. These compounds are useful as insecticides.

3,746,763

TWO-STEP HYDROGENATION OF LYSINE AMIDE PRECURSORS

Robert Fuhrmann, Morris Plains, and John Pisanchyn, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 29, 1971, Ser. No. 215,960

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 A 18 Claims

A process for the preparation of D,L,-lysine amide by the two-step hydrogenation of 2-oximino-6-nitrohexanamide. In the first step, 2-oximino-6-aminohexanamide is produced as an intermediate, and claimed as a new product. Water is removed from the reaction products of the first step, and in the second step the intermediate 2-oximino-6-aminohexanamide is hydrogenated to D,L,-lysine amide.

3,746,764

MEDICAMENT WITH HYPOGLYCEMIC PROPERTIES AND PROCESS FOR ITS PREPARATION

Joseph Nordmann, Paris, Georges Dominique Mattioda, Enghien-les-Bains, and Gerrard Paul Marie Henri Loiseau, Sceaux, France, assignors to Ugine Kuhlmann, Paris, France

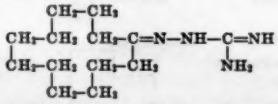
No Drawing. Filed Oct. 14, 1971, Ser. No. 189,258

Claims priority, application France, Oct. 14, 1970, 7037063

Int. Cl. C07c *129/00*

U.S. Cl. 260—564 F 1 Claim

The present invention provides a compound of the following formula:



useful as a medicament having hypoglycemic properties.

3,746,765

DIOXOCYCLOHEXANE CARBOXYLIC AND THIOCARBOXYLIC ACID ANILIDES

Heinrich Ruschig, Bad Soden, Taunus, Johann Konig, Niederhofheim, Taunus, Walter Dittmar, Hofheim, Taunus, Peter Klatt, Kelkheim, Taunus, and Dieter Duwel, Hofheim, Taunus, Germany (all % Farbwerke Hoechst AG, Frankfurt am Main, Germany)

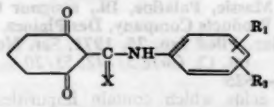
No Drawing. Filed Aug. 5, 1971, Ser. No. 169,530

Claims priority, application Germany, Aug. 8, 1970, P 20 39 466.5

Int. Cl. C07c *103/86, 153/05*

U.S. Cl. 260—551 S 7 Claims

A compound of Formula I



(I)

in which

X represents orygen or sulfur,

R_1 represents halogen, trifluoromethyl, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen-alkoxy of 1 to 4 carbon atoms, or, if X stands for sulfur, R_1 stands for hydrogen, and

R_2 represents hydrogen or the substituents given for R_1, which compound has interesting chemotherapeutical properties and is effective against intestinal worms as helminths, especially against liver flukes. Because of their antimycotic properties, the compounds of the invention may also be used in human medicine and in veterinary medicine to attack fungus infections.

ERRATA

For Classes 424—219 and 424—319 see: Patents Nos. 3,746,490 and 3,746,495

3,746,766

ACARICIDAL ISOCYANO-DIPHENYL-ETHERS AND THIOETHERS

Ingeborg Hammann, Cologne, Germany, Peter Hoffmann, Hollywood, Calif., Helmut Kleimann, Leverkusen, Dieter Marquarding, Bonn, and Klaus Offermann, Dormagen, Germany, Ivar Ugi, Santa Monica, Calif., and Günter Unterstenhöfer, Opladen, Germany, assignors to Bayer Aktiengesellschaft

No Drawing. Original application Apr. 1, 1969, Ser. No. 812,361, now Patent No. 3,627,811, dated Dec. 14, 1971. Divided and this application Sept. 23, 1971, Ser. No. 183,241

Claims priority, application Germany, Apr. 4, 1968, P 17 68 130.0

Int. Cl. A01n 9/20

U.S. Cl. 424—304 12 Claims

Isocyano-diphenyl ethers and thioethers, i.e. isocyano-(optionally mono- and dichloro, alkyl and alkoxy)-4'-alkyl-diphenyl ethers and thioethers, or 1-(4'-alkyl- phenoxy and -phenylmercapto)-(optionally 2,3,4,5 and/or 6-mono- and di-chloro, alkyl and alkoxy)-phenyl-isocyanides, which possess pesticidal, especially acaricidal, properties.

3,746,767

MOTHPROOFING WOOL

Anthony M. Schwartz, Rockville, and Charles A. Rader, Laurel, Md., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 7, 1971, Ser. No. 104,762

Int. Cl. A01n 9/20

U.S. Cl. 424—329 7 Claims

A very limited group of quaternary ammonium compounds were found to effectively mothproof wool. Tricaprylylmethylammonium chloride (Aliquat 336), didecyldimethylammonium chloride (Aliquat 203), and dioctyldimethylammonium chloride (Aliquat 202) at add-on levels as low as 0.5% provided very good protection against both black carpet beetle and webbing clothes moth larval feeding.

3,746,768

SUBSTITUTED PHENYL ETHERS AND THIOETHERS AS INSECT REPELLENTS

Carl Bordenca, Ponte Vedra Beach, and Kenneth P. Dorschner and Robert P. Johnson, Jacksonville, Fla., assignors to SCM Corporation, Cleveland, Ohio

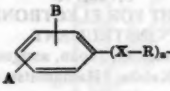
No Drawing. Filed Oct. 2, 1970, Ser. No. 77,702

Int. Cl. A01n 9/22, 9/24

U.S. Cl. 424—330 7 Claims

Novel compositions comprising:

(a) An amount effective for repelling insects of a compound of the formula:



where A is ethylenically unsaturated hydrocarbon containing from 3 to 5 carbon atoms,

X is sulfur or oxygen,

R is lower alkylene containing from 1 to 6 carbon atoms,

B is lower alkyl thio or alkoxy containing from 1 to 4 carbon atoms,

Y is selected from the group consisting of N-heterocyclic and

where R' and R'' are hydrogen or like or dissimilar saturated or unsaturated lower alkyl,

n is an integer of from 1 to 3, and stable salts thereof; and

(b) An inert carrier therefor, are described. The invention is advantageous in that the compositions exhibit repellent properties for prolonged periods of time toward a wide spectrum of insects.

3,746,769

ETHER COMPOUNDS AS INHALATION ANESTHETICS

Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc.

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,248

Int. Cl. A61k 27/00

U.S. Cl. 424—342 8 Claims

Aliphatic ether compounds of the formula

$$CHF_2—CH_2—O—CF_2—CHX_2$$

wherein each X is F or Cl, are useful as inhalation anesthetics.

3,746,770

ETHER COMPOUNDS AS INHALATION ANESTHETICS

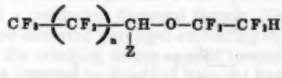
Ross C. Terrell, Plainfield, N.J., assignor to Airco, Inc.

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,400

Int. Cl. A61k 27/00

U.S. Cl. 424—342 2 Claims

Aliphatic ether compounds of the formula



wherein Z is CH_3 or Cl, and *n* is zero when Z is CH_3 and is one when Z is Cl, are useful as inhalation anesthetics.

ERRATUM

For Class 424—258 see:
Patent No. 3,746,714

3,746,771

POKING DEVICE FOR ELECTRIC SMELTING FURNACE OF CLOSED-TYPE

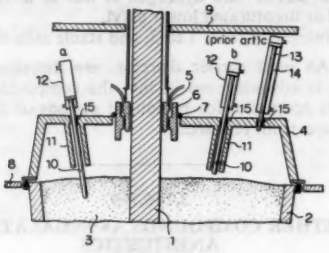
Koichi Horibe; Shoji Kaneko; Tomoyuki Sato, and Kiyoshi Haniu, all of Arai, Japan, assignors to Tanabe Kakoki Co., Ltd., Niigata-ken, Japan

Filed Apr. 18, 1972, Ser. No. 245,146

Claims priority, application Japan, Apr. 20, 1971, 46/25516; Aug. 6, 1971, 46/59492

Int. Cl. F27d *3/00*; H05b *7/02*

U.S. Cl. 13—1 3 Claims



An improved poking device for extremely high temperature electric smelting furnace of closed-type characterized by an assembly consisting of a water-cooled protecting cylinder fixed inside of the furnace lid to each of the poking apertures bored therethrough; a poking rod which passes up and down through said protecting cylinder; and driving means connected with said poking rod.

3,746,772

ELECTRONIC MUSICAL INSTRUMENT WITH BUILT-IN TAPE RECORDER

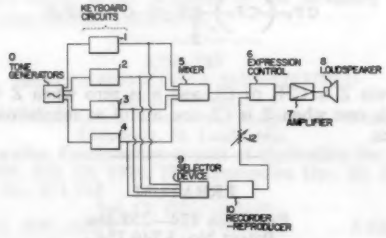
Mikio Ogi, and Yasuji Uchiyama, both of Hamakita-shi, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed May 8, 1968, Ser. No. 727,644

Claims priority, application Japan, May 13, 1967, 42/30093; May 13, 1967, 42/30094

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.02 5 Claims



A multichannel tape recorder and variously selectable switches on its recording and reproducing sides are connectable between each of keyboard circuits and the audio amplifier of an electronic musical instrument, whereby a large variety of operations and utilizations of the combination of the instrument and the tape recorder are afforded.

3,746,773

ELECTRONIC ORGAN EMPLOYING TIME POSITION MULTIPLEXED SIGNALS

Dale M. Uetrecht, Cincinnati, Ohio, assignor to D. H. Baldwin & Company, Cincinnati, Ohio

Filed Feb. 4, 1972, Ser. No. 223,629

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 11 Claims

An electronic organ including a counter acting as a source of twelve repetitive time position multiplexed signals, one time position being provided for each note nomenclature of the musical scale, time positioned pulses being gated through respective key switches having the same nomenclature as respective time position slots. All time positioned signals passed by any octave of key switches are combined on a single octave output lead assigned to that octave, and signals on octave output leads are selectively combined by coupler logic, output signals derivable from the coupler logic network being combined with pulse position signals derived directly from the source to provide coincident gate signals which cause tone source signals to be fed via tone color filters to an output load.

3,746,774

MANDOLINE EFFECT PRODUCING CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT

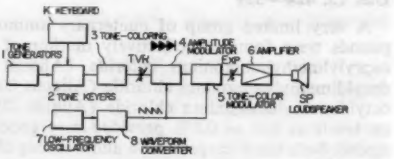
Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Dec. 21, 1971, Ser. No. 210,330

Claims priority, application Japan, Dec. 25, 1970, 45/130643

Int. Cl. G10h *1/04*

U.S. Cl. 84—1.22 5 Claims



A mandoline effect producing circuit included in an electronic musical instrument, comprising an oscillator for generating a low frequency signal corresponding to the frequency of the tremulous performance of the mandoline, a waveform converter which converts the low-frequency signal to a signal having a waveform repeatedly rising sharply and decaying slowly, an amplitude-modulation circuit which controls the envelope in amplitude of a music tone signal in conformance with the output of the waveform converter, and a tone-color modulation circuit which controls the harmonic components within the music tone signal depending on the same output of the waveform converter, whereby the amplitude and the tone color are varied synchronously.

3,746,775

KEYER CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT

Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Mar. 16, 1972, Ser. No. 235,350

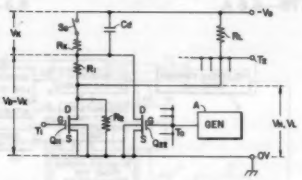
Claims priority, application Japan, Mar. 23, 1971, 46/4616632

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.26 7 Claims

In an electronic musical instrument, a sustain keyer circuit comprises a field effect transistor, a resistor and a key-

operated switch all connected in series between a ground a power line. An input tone signal supplied to the gate of the FET is keyed to appear at the drain thereof. A capacitor is connected across the key-operated switch. Between the



capacitor and the ground is connected another FET which is switched on and off by a rectangular wave having a supra-audible frequency and a variable duty factor thereby exhibiting a variable average resistance, determining a sustain time in cooperation with the capacitor.

3,746,776

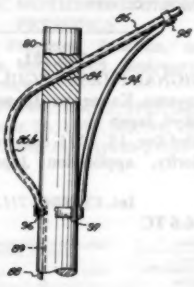
RESIN COATED WOODEN POLES AND LIGHT STANDARDS INCORPORATING SAME

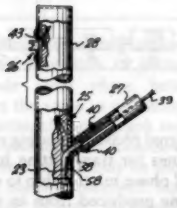
Victor C. Monahan; Gerald L. Monahan, both of Tacoma, and Clyde Y. Cundy, Olympia, all of Wash., assignors to Cascade Pole Company, Tacoma, Wash.

Division of Ser. No. 714,628, March 20, 1968, Pat. No. 3,562,403. This application Feb. 4, 1971, Ser. No. 112,781

Int. Cl. F21s *1/10*; E04h *12/00*

U.S. Cl. 174—45 R **14 Claims**





Resin coated, preservative impregnated wooden poles having one or more longitudinal kerfs, for stress relieving and ventilation purposes, at least one kerf being cut to a depth slightly greater than the thickness of the sapwood of the pole. A shielded electrical conduit is emplaced in one such kerf and covered by a wood putty or like filler restoring the surface profile of the pole, and the pole is encased to a thickness of at least about 1/10 inch with a sprayed-on resin mix, such as a mixture of chopped glass fibers and catalyzed polyester resin. Modifications include a covering of cellophane, paper or the like applied between the pole and the plastic coating especially when an oil base preservative is used, and a top cap to prevent entrance of moisture and to ventilate the interior of the pole. Various luminaire support arms and techniques for mounting thereof on the pole are also disclosed.

3,746,777

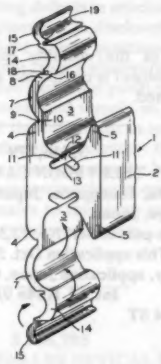
COMPRESSION CONNECTOR FOR ELECTRICAL CONDUCTORS WITH TABS IN SERIES

Vernon E. Peek, Palmerdale, Ala., assignor to Anderson Electric Corporation, Leeds, Ala.

Filed Aug. 30, 1972, Ser. No. 284,890

Int. Cl. H02g *15/08*

U.S. Cl. 174—94 R **8 Claims**



The compression connector has a metal body with a conductor-receiving recess opening outwardly laterally of the body and defined by spaced side walls extending endwise of the body. The outer edge of one of the side walls carries a plurality of tabs which can be folded into stacked face to face relation to each other, and, in the stacked relation, can be swung into the recess through the open side of the recess so as to close its open side and provide a filler partially filling the recess around a conductor disposed therein. The side walls and tabs can be distorted into tight embracing relation to the conductor by die crimping forces applied toward the base of the recess. The tabs can be detached from the body, selectively, so as to change the overall size of the filler in an inverse relation to the cross section of the conductor to be connected.

3,746,778

LIMITED VISIBILITY SIMULATION FOR A VEHICLE TRAINER VISUAL SYSTEM

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

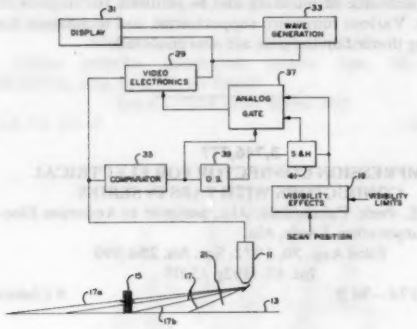
Filed Oct. 26, 1971, Ser. No. 192,531

Int. Cl. H04n *9/02*

U.S. Cl. 178—5.2 R **7 Claims**

Apparatus is provided to prevent the top portions of vertical objects, displayed on a scanned raster display being used to present a visual scene to an observer in a vehicle trainer and having its fast sweep in the vertical direction, from being ob-

scured when a limited visibility function is used to modify the display in which on a line by line basis the objects are detected



and the value of the visibility function held fixed until scanning of the object is completed at which time the normal function is resumed.

3,746,779

TELEVISION CAMERA

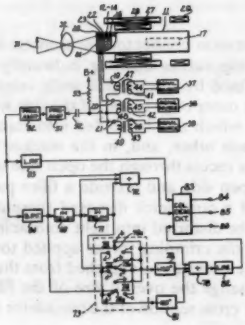
Yasuharu Kubota, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 72,593, Sept. 16, 1970, Pat. No. 3,688,020. This application Oct. 5, 1971, Ser. No. 186,729

Claims priority, application Japan, Oct. 6, 1970, 45/87752

Int. Cl. H04n *9/06*

U.S. Cl. 178—5.4 ST **12 Claims**



A color television pickup system and device comprising three sets of strip electrodes capable of being energized to establish voltage patterns on the photoelectric surface of the device. When the surface is scanned by an electron beam, indexing signals are generated that depend on the voltage of the electrodes. This voltage is changed at the end of each scanning line interval. Optical strip filters aligned with the sets of electrodes in sets of fundamental color components color-separate light from the object being televised, and the signals generated by the photoelectric surface can be related to the light colors by the index signals. The output signals are selectively filtered, delayed, and combined to separate image signals from indexing signals, to produce luminance and chrominance signals, and to separate signals for each color.

3,746,780

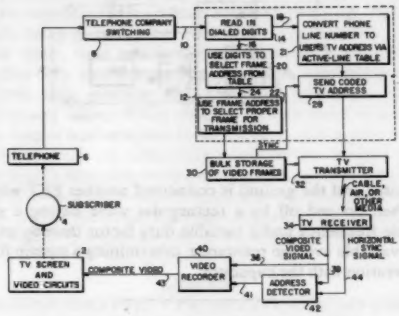
VIDEO DISPLAY SYSTEM

Kenneth J. Stetten, Reston, and Rollin P. Mayer, Arlington, both of Va., assignors to The Mitre Corporation, Bedford, Mass.

Filed Feb. 25, 1971, Ser. No. 118,904

Int. Cl. G11b *27/10, 31/00;* **H04n** *5/78*

U.S. Cl. 178—6.6 A **2 Claims**



A video information transfer and display system having a plurality of video display devices and apparatus to select for display at particular display devices, on the basis of identification data incorporated within the video signals, predetermined video display information from sequential video signals also received at many other display sites. Video recorders are adapted to record selected portions of commercial television-type video signals and maintain the image displayed on associated television receivers.

3,746,781

VIDEO SIGNAL PHASE REGULATING SYSTEM

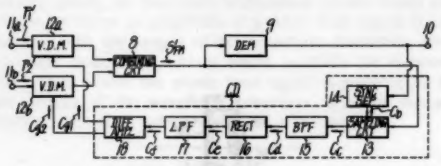
Masayuki Nakayama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1971, Ser. No. 208,146

Claims priority, application Japan, Dec. 22, 1970, 45/116489

Int. Cl. H04n *7/12*

U.S. Cl. 178—6.6 TC **6 Claims**



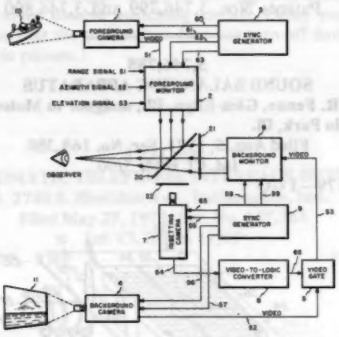
In a video signal phase regulating system having at least two transmitting lines for transmitting rectangular signals with a predetermined phase relationship to each other, the rectangular signals being produced from an angular-modulated video signals, means for combining the rectangular signals, and means for detecting a phase difference between the rectangular signals in response to alteration of the phase relationship therebetween. The system is further provided with at least one variable delay means connected to one of the transmitting lines and controlled by an output signal derived from the phase difference detecting means. The delay means regulates the rectangular signals to maintain a determined phase relationship between them.

3,746,782

SHRUNKEN RASTER WITH IMAGE INSETTING

Carl R. Driskell, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1971, Ser. No. 195,718
Int. Cl. H04n 5/22, 7/18
U.S. Cl. 178—6.8 3 Claims



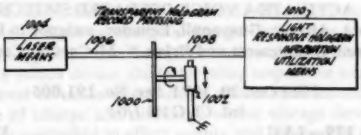
Means for insetting a foreground image in a background image in a television display. A combination of electronic and optical elements function to cut out a part of the background image the exact shape of the foreground image. The foreground image is then optically inserted in the cut-out space in the background image.

3,746,783

SHUTTERLESS PLAYBACK DEVICE FOR HOLOGRAPHIC MOTION PICTURE RECORD PRESSINGS

Hendrick Gerritsen, Princeton Junction, and David L. Greenaway, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 509,100, Nov. 22, 1965, abandoned. This application Sept. 28, 1970, Ser. No. 75,908
Int. Cl. H04n 7/00; G02b 27/00
U.S. Cl. 178—6.8 6 Claims



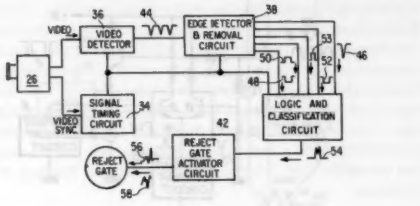
Hologram record pressings having impressions thereon of a type homologous to the impressions of phonograph record pressings may be made from phase hologram master recordings by techniques the same as or similar to those employed in making conventional phonograph record pressings. Such a hologram record pressing may include a large number of separate small holograms, which may be used to play back motion pictures over a suitable playback equipment. Such playback equipment may include illuminating means for producing a primary beam of spatially coherent monochromatic light and shutterless means for moving the record with respect to the illuminating means to continuously illuminate in sequence the holograms while they are being moved. The playback equipment further includes light responsive hologram information utilization means, such as a closed circuit television system, having an information-carrying secondary beam derived from the illuminated holograms continuously applied as an input thereto.

3,746,784

ELECTRONIC DEFECT DETECTING APPARATUS

Jack T. Van Oosterhout, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Aug. 16, 1971, Ser. No. 171,894
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 24 Claims



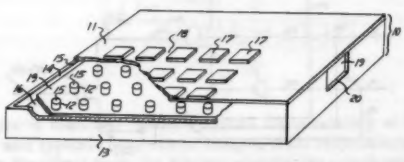
An assembly for detecting defects in articles of manufacture such as, for example, glassware is disclosed herein and includes a semi-diffused light source positioned adjacent one side of and optically distant from a glassware sample for illuminating the latter. A video camera is positioned on the other side of and scans the illuminated sample so as to produce a video signal indicative of the difference in refraction characteristics thereof, and thereby indicates the presence or absence of defects in the glassware sample. In the event there is a defect, an electrical processing circuit, connected with the video camera and responsive to the video signal, is provided for actuating a glassware reject mechanism.

3,746,785

DEFLECTABLE MEMBRANE OPTICAL MODULATOR

George W. Goodrich, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 26, 1971, Ser. No. 202,432
Int. Cl. H04n 5/66
U.S. Cl. 178—7.5 D 21 Claims

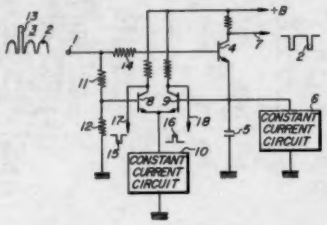


A deflectable membrane optical modulator with an improved substrate for support of the deflectable member is described. The improved substrate supports the deflectable member in close proximity to a parallel contiguously conductive electrode with an array of dielectric pillars of sufficient number and geometrical arrangement so that the supported light reflective deflectable membrane, in the absence of electrostatic forces, forms a mirror with the required optical qualities. The deflectable member is a dielectric membrane and is made reflective by the application of light reflecting materials to its external surface in a manner spatially preserving the dielectric characteristics of the membrane to the same order of magnitude as the spatial resolution defined by the geometrical pattern of the supporting dielectric pillars.

3,746,786
NOISE DETECTING CIRCUIT FOR TELEVISION RECEIVERS AND THE LIKE

Yoshihisa Nomoto; Masanori Oguino, both of Yokohama; Seiichi Ueda, Kodaira-shi, and Sadao Kitamura, Kamakura-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Claims priority, application Japan, Apr. 30, 1971, 46/27962
Filed Apr. 25, 1972, Ser. No. 247,383
Int. Cl. H04n 5/08
U.S. Cl. 178—7.3 S 10 Claims

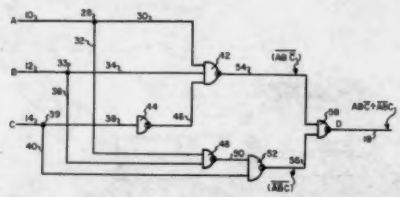


A noise detecting circuit for television receivers comprises a pair of transistors whose emitters are connected to a constant current circuit so as to maintain constant the sum of the emitter current of the pair of transistors. Composite video signals are supplied to the base on the first transistor in the pair and a DC voltage whose value is proportional to synchronizing signals contained in the composite video signals is supplied to the base of the second transistor in the pair. A pulse is taken out from the collector of the first transistor when noise whose value is greater than the DC voltage is supplied to the base of the first transistor. The pulse is used to cancel the noise generated in a synchronizing signal separating circuit.

3,746,787
DIGITAL METHOD OF GENERATING A CONTINUOUS PHASE FSK LINESIGNAL IN RESPONSE TO AN ASYNCHRONOUS BINARY INPUT SIGNAL

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 3, 1970, Ser. No. 94,657
Int. Cl. H02b 1/00
U.S. Cl. 178—66 A 8 Claims



In a data transmission system capable of accepting an asynchronous data input and generating an FSK line signal in response to the asynchronous input, a logic processor accepts as one input the asynchronous data signal or binary facsimile signal, as a second input a frequency that is N times the frequency difference between the two frequencies which represent the two binary states, i.e., mark or space, and as a third input a frequency that is N times the frequency which represents the lower of the two frequencies representing the two binary states. The signals are combined in digital logic circuits to satisfy the logic relation D = AB C where the plus indicates here Exclusive-OR addition. This results in a square wave output D that provides one of three possible output frequencies. Next the modulated wave is divided down in a binary counter to place the wave in the desired portion of the frequency band. This process suppresses substantially the third output frequency which is not desired, leaving only the two frequencies representing two binary states. Thus the two principal frequencies of the FSK signal are obtained at the output of the frequency divider, and the FSK signal has substantially continuous phase.

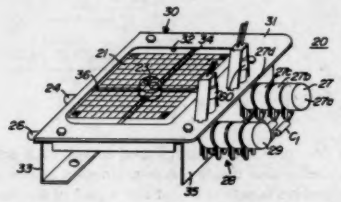
ERRATA

For Classes 178—22 and 178—69 see:
Patents Nos. 3,746,799 and 3,746,800

3,746,788
SOUND BALANCING APPARATUS

Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 5, 1971, Ser. No. 169,388
Int. Cl. H04r 5/00
U.S. Cl. 179—1 GQ 9 Claims

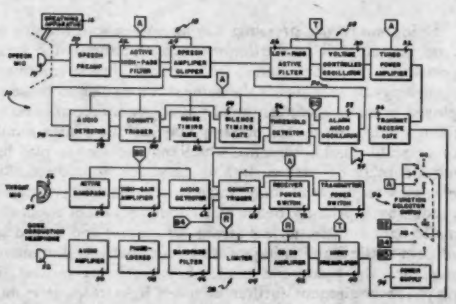


A sound balancing apparatus for a four-channel sound system having a rectangular grid display surface representative of a two-dimensional listening area defined by forward and rear pairs of right and left-hand loudspeaker units. Mechanical means are associated with the grid surface for moving an indicator means to any selected coordinate position on the grid surface which position simulates a corresponding position within the two-dimensional listening area. Electrical means are then associated with the mechanical means for balancing the input drive signal of each of four separate audio channels to a respective loudspeaker unit to thereby create an apparent balance of sound at the selected coordinate position within the listening area.

3,746,789
TISSUE CONDUCTION MICROPHONE UTILIZED TO ACTIVATE A VOICE OPERATED SWITCH

Ernesto A. Alcivar, Guayaquil, Ecuador, assignor to Dennis J. Johnson, Swampscott and Brian N. McCarthy, Cambridge, Mass.

Filed Oct. 20, 1971, Ser. No. 191,006
Int. Cl. G10l 1/04
U.S. Cl. 179—1 VC 13 Claims



A voice-activated transmit switch (VOX) for high noise environment voice communication systems which employ a

speech microphone, a transmitter and a receiver. A separate tissue-conduction microphone is employed to generate a signal which activates a transmitter enabling and receiver disabling circuit. The tissue-conduction microphone is positioned in contact with the user's neck tissue in the vicinity of the larynx. A bandpass filter eliminates the unwanted signal from the tissue-conduction microphone output and passes the desired speech signals to an amplifier. The amplifier output actuates a Schmitt trigger which in turn operates a transmitter enable-receiver disable switching circuit. Delay means are provided so that the transmitter does not turn off during brief intersyllabic pauses.

3,746,790

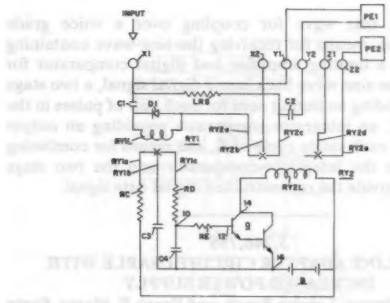
AUTOMATIC TELEPHONE INTERFACE DEVICE

C. M. Ault, 2740 S. Sheridan Ave., Indianapolis, Ind.

Filed May 27, 1971, Ser. No. 147,365

Int. Cl. H04m *1/00*

U.S. Cl. 179—1 HF **10 Claims**



A telephone interface device is provided for seizing and holding a telephone line after a predetermined ringing cycle duration while further controlling the duration of the line seizure to connect peripheral equipment devices to the telephone line, hold the line open to permit answering an incoming call without undue haste and to effect transmission of ambient sounds over the line to simulate inhabitation of the dwelling in which the receiver is located. A first relay responds to the ringing cycle to charge a storage device to a predetermined energy level that energizes a second relay through a solid state switch device, the latter being responsive to a lesser energy level to cause deactivation of the said second relay. The rate of charge and discharge of the storage device are selectively controlled to effect seizure and subsequent disconnection of the telephone line after selected intervals of line seizure. The second relay effects line seizure and peripheral equipment energization and the interfacing of the latter with said telephone line.

3,746,791

SPEECH SYNTHESIZER UTILIZING WHITE NOISE

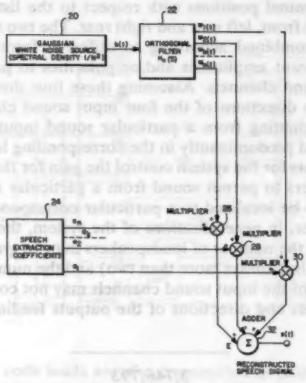
Alfred A. Wolf, R.F.D. 3, Box 327, Annapolis, Md.

Filed June 23, 1971, Ser. No. 155,988

Int. Cl. G10l *1/00*

U.S. Cl. 179—1 SA **11 Claims**

The present invention relates to a system and corresponding subsystem devices for synthesizing and codifying speech from broadband white noise. The system employs a gaussian white noise source, the output of which is fed through an orthogonal filter to produce a set of random orthogonal functions. These orthogonal functions when multiplied by a speech signal and temporally averaged, produce a set of slowly time-varying coefficients which can be used to reproduce a voice signal.



This device is somewhat analogous to the use of generalized Fourier coefficients to define a periodic function.

3,746,792

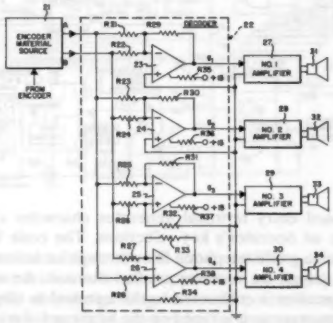
MULTIDIRECTIONAL SOUND SYSTEM

Peter Scheiber, 1987 Crompond Rd., Peekskill, N.Y.

Continuation-in-part of Ser. Nos. 697,103, Jan. 11, 1968, and Ser. No. 853,822, Aug. 28, 1969, and Ser. No. 888,440, Dec. 29, 1969, Pat. No. 3,632,886. This application June 15, 1970, Ser. No. 46,345

Int. Cl. H04h *5/00*

U.S. Cl. 179—1 GQ **14 Claims**



There is disclosed a sound system for producing at least three and typically four sound outputs from respectively different directions from the listener wherein the sound content per se and the directional information are encoded on a conventional standardized two-channel record or on a transmission by a conventional two-channel broadcasting medium such as stereo FM. The system is maximally compatible with existing systems in the sense that reproduction on existing two-direction (stereo) or one-direction (mono) sound systems is completely satisfactory although, of course, the extent of directionality reproduction is limited by the inherent characteristics of such existing systems. In a typical example, the system provides for four directional sound inputs with equal, 90° separation around a circle. The four sound inputs are fed to two sound channels, for example stereo recording or transmission channels. Each of the four sound input channels is fed in part to each of the two stereo channels but the polarity and/or amplitude of each sound input channel is different in each of the stereo channels. Conventional analog computer electronic circuits may be utilized to transform the four sound

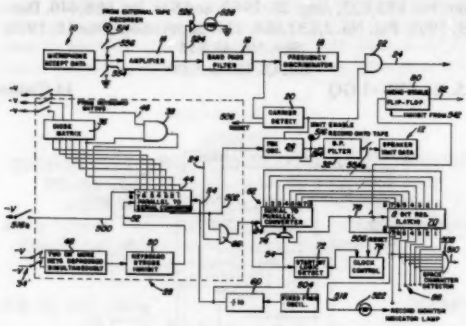
input signals into two stereo channels according to prescribed formulae. The system provides for reproduction of sound from four loudspeakers located in the four corners of a room and having nominal positions with respect to the listener of left front, right front, left rear and right rear. The two stereo channels are combined according to different formulae setting forth different amplitudes and/or polarities to produce four output sound channels. Assuming these four directions correspond to directions of the four input sound channels, and sound originating from a particular sound input channel is reproduced predominantly in the corresponding loudspeaker. Refinements for the system control the gain for the respective loudspeakers to permit sound from a particular input sound channel to be localized to a particular corresponding output loudspeaker. In generalizations of the system, the number of inputs and the number of loudspeakers may be greater or less than four (but always more than two) and the numbers and/or directions of the input sound channels may not correspond to the numbers and directions of the outputs feeding the loudspeakers.

3,746,793

TELEPHONE COMMUNICATION SYSTEM FOR THE HEARING IMPAIRED

Reynold M. Sachs; Henri P. Boutin, both of McLean, Va., and Frank Cicchiello, Norristown, Pa., assignors to Phonics Corporation, Washington, D.C.

Filed Aug. 9, 1972, Ser. No. 279,228
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **7 Claims**



A keyboard entry terminal generates character codes in response to an operator's key selections. The code is transmitted to voice grade telephone lines through an acoustic coupler with a telephone receiver cradled thereon. An ordinary television receiver is connected to the terminal to display the operator's message as it is typed on the keyboard. An identical terminal is located at the other end of the telephone lines so that the code transmitted over the lines is received by the remote terminal through its acoustic coupler, upon which the receiving station telephone receiver is similarly cradled. Again, an ordinary TV receiver is connected to the terminal at the receiver station for the display of the incoming message. Transmission from the receiver station can then take place as outlined above.

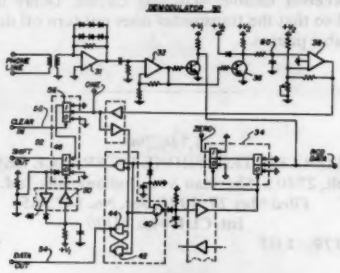
3,746,794

MODULATOR-DEMODULATOR APPARATUS FOR COMMUNICATION OF DIGITAL DATA OVER VOISE GRADE TELEPHONE LINES

Jack Stifle, Paxton, and Michael Johnson, Champaign, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed July 7, 1971, Ser. No. 160,429
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP **3 Claims**

A data modem (modulator-demodulator) apparatus for transmitting and receiving digital data over voice grade telephone lines having a multivibrator, a two station counter providing frequencies f_0 and f_1 with 2/1 ratios, composite signal generator responsive to the f_0 and f_1 signals to provide a pulse train comprising an integral number of cycles of f_0 and f_1, wherein one cycle of f_1 is provided for each binary one in the incoming digital data signal and two cycles of f_0 are provided for each binary zero in the incoming digital data signal, filter means for transforming the pulse train into an approxi-



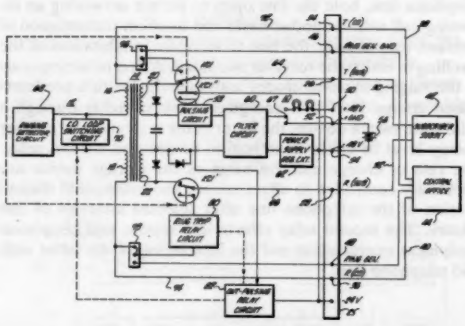
mation of a sine wave for coupling over a voice grade telephone line, means for receiving the sine wave containing information, a limiting amplifier and digital comparator for converting the sine wave back into a digital signal, a two stage counter providing an output zero for each pair of pulses in the digital signal, an integrator-comparator providing an output one level for each single cycle of f_1, and means for combining outputs from the integrator-comparator and the two stage counter to provide the reconstructed digital data signal.

3,746,795

LONG LINE ADAPTER CIRCUIT USABLE WITH INCREASED POWER SUPPLY

Alan R. Fitzsimons, Laguna Beach, and Frank P. Mazac, Santa Ana, both of Calif., assignors to San/Bar Electronics Corp., Santa Ana, Calif.

Filed Nov. 2, 1970, Ser. No. 86,039
Int. Cl. H04q *1/30*
U.S. Cl. 179—16 F **10 Claims**



An improved long line adapter circuit designed to provide ringing supervision, pulse repetition and adequate transmission current for abnormally long subscriber loops and which may be used either at a central office or at a midplacement point to couple a subscriber facility to the central office, is disclosed. Included in the long line adapter circuit is a subscriber circuit and a central office circuit. A line coupling transformer is employed to provide audio coupling between the central office and subscriber circuits. A solid-state pulsing circuit is included in the subscriber circuit to respond to dialing at a subscriber subset and to a receiver thereof being placed in an off-hook condition. The adapter circuit is designed to be used

with external power supplies providing either the standard 48 volts for normally distant subscriber loops or to provide a total of 96 volts for very long subscriber loops. A voltage converter or booster circuit and an off-hook sensing circuit may be included in the adapter circuit for the purpose of internally developing the additional + 48 volts for very long subscriber loops while employing the normal negative 48 volt external power supply.

3,746,796

TELECOMMUNICATION EXCHANGE SWITCHING NETWORK FOR FOUR WIRE SWITCHING

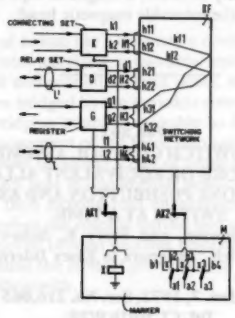
Hartmut Gebhardt, Krailing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 12, 1971, Ser. No. 171,138

Claims priority, application Germany, Aug. 18, 1970, P 20 41 052.0

Int. Cl. H04q 3/42

U.S. Cl. 179—18 AF **2 Claims**



A telecommunication exchange installation is described which has a switching network constructed of coupling multiples arranged in several coupling stages. The coupling stages are interconnected over intermediate lines. All local and long distance lines and all inputs and outputs of switching members necessary for the completion of a connection and for connection monitoring are connected in the same manner to the inputs of a first coupling stage. The outputs of the coupling multiples of the first coupling stage are connected to the inputs of the next coupling stage in a pairwise manner. The switching network is constructed for two wire switching, but in a manner which will permit four wire elements to be connected thereover.

3,746,797

TELEPHONE SWITCHING SYSTEM SCANNING AND IDENTIFICATION ARRANGEMENT

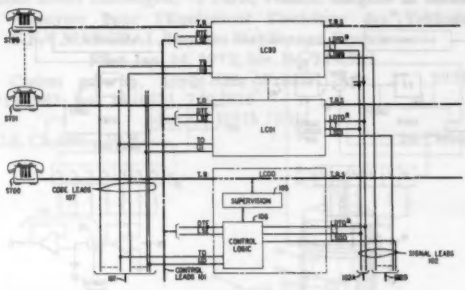
Henry August Meise, Jr., and George William Taylor, both of Boulder, Colo., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 3, 1972, Ser. No. 249,799

Int. Cl. H04q 3/70

U.S. Cl. 179—18 D **18 Claims**

An electronic, wired logic, scanner controlled PBX is disclosed having code leads which interconnect a system controller with line circuits, trunk circuits, and registers. The controller applies signals to the code leads to identify a calling line circuit at the initiation of a call. A register stores both the calling and called numbers and gates this information onto the code leads at different times to identify the calling and called lines, respectively. The identification and selection signals applied to the code leads are also transmitted as path establishment signals to a network controller.



3,746,798

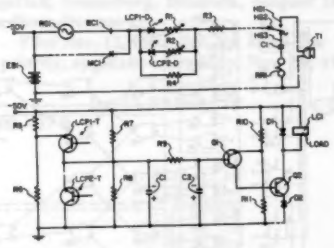
ELECTRONIC RING TRIP CIRCUIT

Robert M. Thomas, Brockville, Ontario, Canada, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 23, 1972, Ser. No. 256,103

Int. Cl. H04m 3/04

U.S. Cl. 179—18 HB **4 Claims**



A circuit to detect the off-hook condition of a telephone subscriber station after the application of ringing current to operate the station signaling device. The circuit employs a pair of light emitting diodes, connected in an inverse parallel configuration, in series with one of the line conductors and light coupled to a pair of associated photo transistors. The photo transistors operate to alternately charge and discharge an RC circuit in response to the passage of an A.C. ringing current through the line, but upon detecting a direct current flow in the line conductor bring the RC circuit to a fully charged state to trip a load circuit to remove the ringing current from the line.

3,746,799

METHOD AND APPARATUS FOR ENCODING AND DECODING ANALOG SIGNALS

Frank H. Gentges, Temple Hills, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

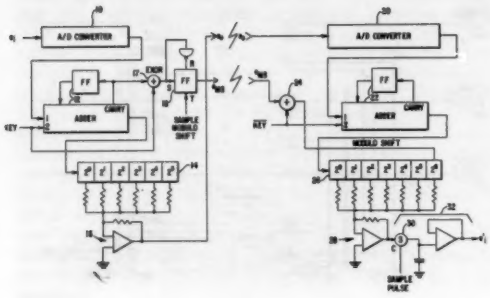
Filed Sept. 27, 1971, Ser. No. 183,835

Int. Cl. H04l 9/02

U.S. Cl. 178—22 **9 Claims**

A method and apparatus for encoding and decoding clear signals of an analog nature, the amplitudes of which represent

information. The method employs a key which controls the coding of the signals, a module shift and the coding of the modulo-shift, the modulo shift being transmitted by time multiplex or on a separate channel from that of the encoded signal.

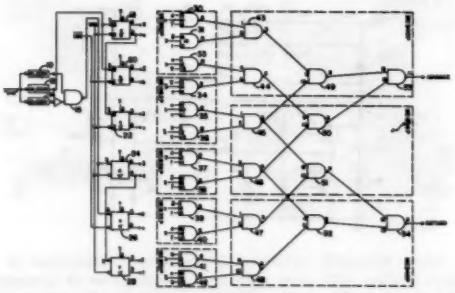


3,746,800

CLOCK RECOVERY SYSTEM

Richard L. Stuart, Beltsville, Md., assignor to Rixon Inc., Silver Spring, Md.

Filed Aug. 16, 1971, Ser. No. 172,089
Int. Cl. H04l *7/00*
U.S. Cl. 178—69.5 R **7 Claims**



A clock recovery circuit for a data communication system, wherein the eye pattern for the data is sampled (by sampling the outputs of the slicer circuits) and logic circuitry utilized to select only those transitions, i.e., slicer axis crossings, which should be located midway between the desired time sample points and to advance or retard the local clock in accordance with the samples for these transistions. The ratio of advance to retard decisions is utilized to generate, through use of a D to A converter, a control signal for correcting the frequency of the voltage controlled oscillator which serves as the local clock, so that both frequency and phase error correction is provided.

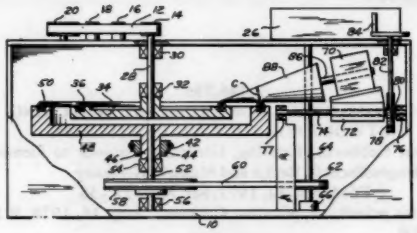
3,746,801

MAGNETIC TAPE SYSTEM WITH VARIABLE SPEED REPRODUCTION

Kenneth R. Wisner, 263-A W. 12th St., New York, N.Y.

Filed June 7, 1971, Ser. No. 150,447
Int. Cl. G11b *5/52;* **F16h** *15/16;* **B65h** *17/20*
U.S. Cl. 179—100.2 T **7 Claims**

A magnetic tape system includes a rotatable magnetic head, a magnetic tape transport for moving a loop of magnetic tape past the rotatable magnetic head, and a movable source record medium such as a tape cassette playback device. Means couple the tape transport to the movable source record medium to maintain a constant ratio between the velocity of the source record medium and the velocity of the magnetic tape. And means including a cone member couple the tape transport to the rotatable magnetic head to maintain a constant relative velocity between a magnetic tape driven by the tape transport and the rotatable magnetic head.

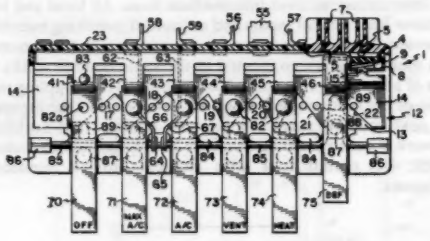


3,746,802

PUSHBUTTON SWITCH CONTROL ASSEMBLY WITH FLEXIBLE CORD OR EQUIVALENT ALLOWING OPERATION OF ONE PUSHBUTTON AND ASSOCIATED SWITCH AT A TIME

Floyd J. Sandi, Clawson, and Terry K. Schawinsky, South Lyon, both of Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Jan. 7, 1972, Ser. No. 216,065
Int. Cl. H01h *9/26*
U.S. Cl. 200—5 E **21 Claims**



A pushbutton control assembly for operating a vehicle's heating, ventilating, and air conditioning system cmprises a housing having a movable valve for operating a plurality of fluid motors and electrical switch contacts for operating a plurality of electrical devices, the valve being adjustable by means of a single slide member the position of which is determined by a selected one of a number of reciprocable pushbuttons which also effect opening and closing of selected switch contacts. A flexible motion transmitting cord is coupled to all of the pushbuttons and is operable to effect movement of a selected pushbutton in one direction in response to movement of any other pushbutton in the opposite direction.

3,746,803

ELECTRICAL SWITCH HAVING TWO MOVABLE CONTACTS OPERABLE BY A ROTOR AND HAVING FIXED CONTACT POSTS

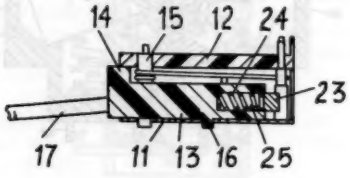
Edward Cryer, Higham, near Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Oct. 7, 1971, Ser. No. 187,272

Claims priority, application Great Britain, Oct. 24, 1970, 50,635/70

Int. Cl. H01h *23/30, 21/18*

U.S. Cl. 200—6 R 4 Claims



An electrical switch has a base and a cover between which is mounted a rotor carrying a movable contact. On the base there are first and second contact posts, and in one position these posts are bridged by the movable contact. There is also a conductive bridging member movable to bridge the posts in response to movement of the rotor into said one position, this bridging member including a pair of limbs arranged to engage the first contact post in one angular position of the rotor, one of the limbs then moving into engagement with the second contact post when the rotor is moved into said one position. If the rotor is moved beyond said one angular position the limbs are urged against the contact posts so as to remain in bridging engagement therewith.

3,746,804

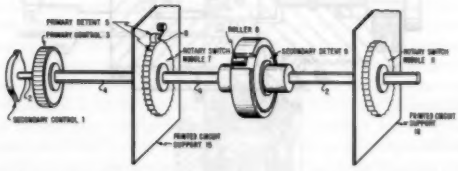
PHASE-LINKING ROTATING MECHANISM FOR PLURAL SWITCH ASSEMBLY

Lawrence A. Gammill, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 23, 1971, Ser. No. 174,069

Int. Cl. H01h *3/52*

U.S. Cl. 200—14 2 Claims



Two or more rotating elements are linked together so they can be rotated simultaneously by a primary control. The first element is detented from a support by a detent that requires a relatively large override torque. Each successive element is detented from the preceding element by a detent that requires less override torque. The primary control, connected to the first element, rotates all the elements simultaneously without changing the phase relationships between elements. A control to a later element rotates that element and the succeeding elements without rotating the preceding elements. Thus, the phase relationship between elements can be adjusted.

3,746,805

JAW LIKE CONTACT BREAKER ASSEMBLY MODULE FIXEDLY SUPPORTED IN DISTRIBUTOR HOUSING AND READILY REMOVABLE THEREFROM

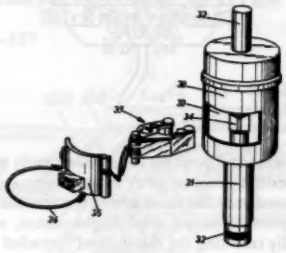
Jean Henri Stellwagen, 75 Paris, France, assignor to Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V.MARCHAL, Issy-Les Moulineaux, France

Filed Jan. 24, 1972, Ser. No. 219,961

Claims priority, application France, Apr. 27, 1971, 7114987; Jan. 26, 1971, 7102815

Int. Cl. H01h *19/00*

U.S. Cl. 200—19 R 26 Claims



A jaw-like contact breaker assembly module is removable from a distributor housing allowing ease in changeability of parts. The jaw-like contact breaker assembly module frictionally fits and engages the cam and associated shaft.

3,746,806

ADJUSTABLE-PROGRAM TIME SWITCH

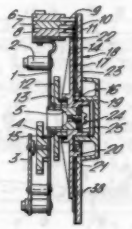
Aksel Jespersen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Nov. 12, 1971, Ser. No. 198,218

Claims priority, application Germany, Nov. 16, 1970, P 20 56 252.1

Int. Cl. H01h *43/10*

U.S. Cl. 200—37 R 7 Claims



This invention relates to an adjustable program time switch assembly. The assembly includes a rotatable timing disk which has a metal surface and an insulator control element mounted for rotation in unison with the disk and in masking relating to predetermined portions of the metal surface. A plurality of fixed contacts brushingly engage the timing disk metal surface except where such surface is masked by the insulator control element.

3,746,807

AUTOMATIC TURN-SIGNAL CONTROLLER

Kiichi Yasuda, 1-35 Funakoshi-machi, Yokosuka 237, Japan

Filed July 25, 1972, Ser. No. 274,984

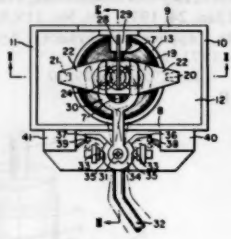
Claims priority, application Japan, Sept. 11, 1971, 46/070536

Int. Cl. H01h *3/16*

U.S. Cl. 200—61.27 7 Claims

An automatic turn-signal control device comprising an axially displaceable threaded member which is driven for rota-

tion by a driving cable extended from the driving shaft of the vehicle with a speed reduction, a pair of pawls either of which can exclusively engage with or disengage from the threaded member, a pair of turn-signal switches which are closed or opened in response to the engagement or disengagement of either pawl, externally operable means to urge either of the



pawls from a neutral position for automatically resetting either pawl to a neutral position away from its engagement with the threaded member at the point where the threaded member has attained a predetermined axial displacement, and means for automatically resetting the disengaged threaded member to its starting point.

ERRATUM

For Class 200—67 see:
Patent No. 3,746,359

3,746,808

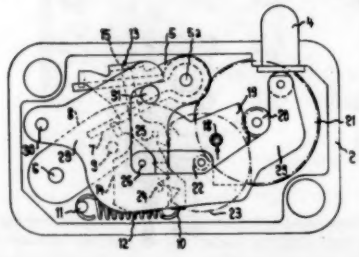
DELAYED SNAP ACTION MICROSWITCH

Charles G. Bechtiger, Colombier, Switzerland, assignor to Reihor S.A., Canton Neuchatel, Switzerland

Filed Jan. 17, 1972, Ser. No. 218,274

Int. Cl. H01h *13/28*

U.S. Cl. 200—67 H **4 Claims**



A microswitch having a snap action, wherein depression of an operating button to a predetermined joint first tensions an operating spring, then when moved beyond the point releases an operating lever which starts a delay mechanism, and finally causes a rapid action of the contacts of the switch.

3,746,809

HAMMER OPERATED SWITCH CONSTRUCTION

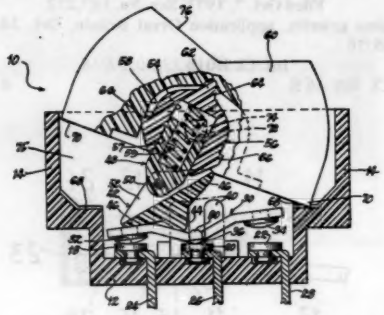
Martin Gaber, 2301 Greenwood, Wilmette, Ill.

Filed Feb. 10, 1972, Ser. No. 225,067

Int. Cl. H01h *13/18*

U.S. Cl. 200—67 G **10 Claims**

A switch construction including a base with at least a pair of stationary contacts on the base and at least one movable contact pivotally mounted on the base for movement relative to the stationary contacts. A hammer is provided for engaging the movable contact to achieve the movement of the movable contact. This hammer includes a first portion engaging the movable contact on one side or the other of the pivot axis of the movable contact. The hammer includes striking portions on opposite sides of the first portion with the striking portions alternately engaging oppositely extending sections of the



movable contact. A ridge is defined at the pivot axis of the movable contact, and the first portion of the hammer is initially forced against this ridge during switch actuation and thereafter the first portion moves rapidly over the ridge at the same time as a striking portion of the hammer engages the movable contact.

3,746,810

PRESSURE OPERATED ELECTRIC SWITCHES WITH FLEXIBLE HELICAL BRIDGING CONTACT

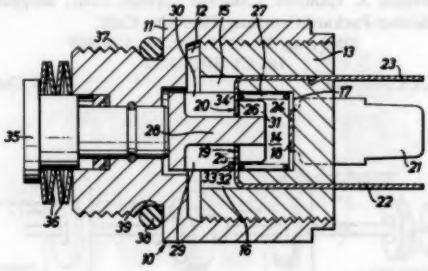
David Parsons, and Walter William Bailey, both of Leamington Spa, England, assignors to Automotive Products Company Limited, Leamington Spa, England

Filed July 28, 1971, Ser. No. 166,745

Claims priority, application Great Britain, Sept. 1, 1970, 41,824/70

Int. Cl. H01h *35/38, 1/20*

U.S. Cl. 200—81 R **8 Claims**



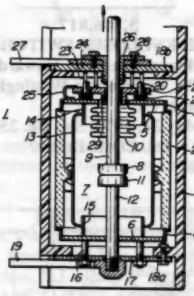
A pressure operated electric switch having two sets of contacts operated at different pressures acting on the switch, comprises a helical conductor in permanent contact with a first fixed contact and normally held out of engagement with a second and a third fixed contact by a plunger which is responsive to the operating fluid pressure. Movement of the plunger following a suitable reduction in the operating fluid pressure first brings the helical conductor into engagement with the second fixed contact and subsequently with the third fixed contact. The plunger may be arranged to disengage from the helical conductor when the latter is engaged with both the second and the third fixed contacts, or the plunger may be arranged to make part of the circuit between the first and second fixed contacts.

3,746,811

VACUUM CIRCUIT BREAKER

Osamu Saito, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo Japan

Filed Aug. 28, 1970, Ser. No. 67,874
Claims priority, application Japan, Sept. 3, 1969, 44/69349
Int. Cl. H01h 33/66
U.S. Cl. 200—144 B 3 Claims



A vacuum circuit breaker in which a lid which hermetically and movably supports through a bellows a holder of a movable electrode disposed opposite to a fixed electrode is electrically connected with a terminal for said movable electrode in such a manner as to lead from said lid to said terminal through said connection a current which otherwise might flow in shunt with an arc, in metal shields through the electrode metal melted by the arcing heat during a breaking operation, said metal shields being provided for preventing the conduction of a vacuum cylinder made of insulating material to contain said electrodes, said current in shunt with an arc being thereby prevented from flowing through said bellows.

3,746,812

SUSPENSION SWITCH WITH GEAR SEGMENT SLIDER AND OPERATING FORCE REGULATING CONTACT OPERATING CAMS

Johannes Kluge; Peter Rabe, both of Wetter; Otto Schmidt, Witten, and Meinlof Schleyer, Unna, all of Germany, assignors to Demag AG, Duisburg, Wolfgang-Reuter-Platz, Germany

Filed June 11, 1971, Ser. No. 152,083
Claims priority, application Germany, Oct. 6, 1970, P 20 49 020.4
Int. Cl. H01h 3/40, 3/42
U.S. Cl. 200—153 L 19 Claims

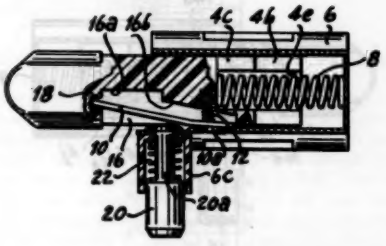
A suspension switch, for controlling electric motors, has plural switching positions selected by actuation of a switch slider which rotates a common carrier shaft carrying several cam disks of different cam shapes and fixed to the common shaft. Respective spring biased rollers cooperate with each cam disk and effect reciprocation of respective contact bridges controlling interconnection of respective pairs of fixed contacts. Each cam disk has a cam track formed with contact making and contact breaking surfaces engageable by the associated roller to actuate the respective contact bridges, and roller abutting surfaces, of differing slopes, interconnect the contact making and breaking surfaces.

3,746,813

LOCK-OFF SWITCH

Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 14, 1972, Ser. No. 217,830
Int. Cl. H01h 13/08, 9/20
U.S. Cl. 200—157 10 Claims



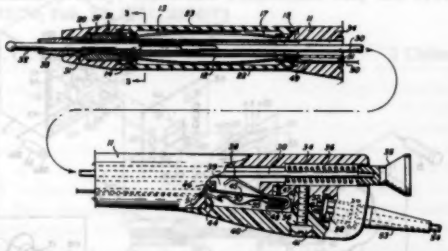
A manual switch that has a built-in rigid lock lever having one end seated in the switch actuator, biased by a helical compression spring, and having a detent at the other end that snaps into a hole in the frame when the switch is released to return to its off position to lock the switch off. A thumb-operated release button when depressed pivots the lock lever to separate the detent from the hole thereby to allow reoperation of the switch actuator. The rigid lock lever is angularly disposed so that attempted forcing of the switch actuator without depressing the release button tightens the locking engagement to absolutely prevent operation.

3,746,814

FINGER ACTUATED SURGICAL ELECTRODE HOLDER

Ray R. Lackey, Madeira, and William T. Bross, Cincinnati, both of Ohio, assignors to Sybron Corporation, Rochester, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,772
Int. Cl. H01h 9/06; A61b 17/36
U.S. Cl. 200—157 14 Claims



A surgical electrode holder is provided with an improved finger pressure operated switch that also incorporates an electrode gripping collet. The collet, which is electrically connected to the control circuit for a radio frequency generator, extends through and slides within a metal pipe. An annular switch element having solid ends and a number of metal strips extending between the ends is mounted coaxial to and surrounding the metal pipe by insulating supports at each end of the switch element. The switch element is encased and protected by a stock into which the metal pipe is inserted, a nose

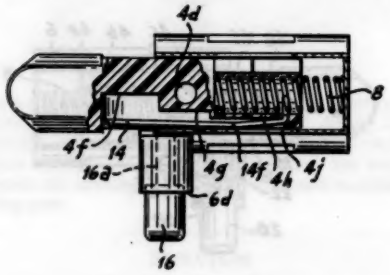
piece in front of the pipe and a rubber tube which surrounds the annular switch element and extends from the stock to the nose piece. The radio frequency generator is activated by squeezing the rubber tube to depress one or more of the metal strips, which are electrically connected to the control circuit for the generator and to the output terminal of the generator, and make contact with the metal pipe.

3,746,815

OFF LOCKING TRIGGER SWITCHES

Merlin R. Drummer, Arab, Ala., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 3, 1971, Ser. No. 195,167
Int. Cl. H01h *13/08, 9/20*
U.S. Cl. 200—157 **8 Claims**



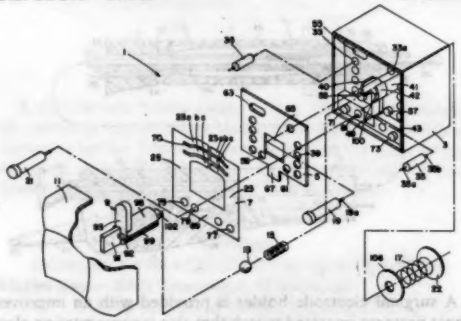
A trigger switch for portable tools such as circular saws and the like having a return-spring biased trigger that is actuated by the forefinger of the user to turn the tool on and upon release returns to off position under spring action. The trigger is provided with a built-in spring biased lock that automatically locks the trigger in its off position whenever the trigger returns thereto. A manual release button is arranged to be pressed by the thumb of the user to release the lock and allow reactuation of the trigger. Two versions of off lock are shown for in-line (linearly movable) trigger and a third version is shown for an overhanging (pivoted) trigger.

3,746,816

PUSHBUTTON CANTILEVERED LEAF SPRING CONTACT SWITCH ASSEMBLY FOR KEYBOARD TYPE SWITCH ARRAYS

John F. Brady, Clifton, N.J., assignor to Universal Technology, Inc., Verona, N.J.

Filed May 18, 1971, Ser. No. 144,605
Int. Cl. H01h *13/66*
U.S. Cl. 200—159 A **14 Claims**



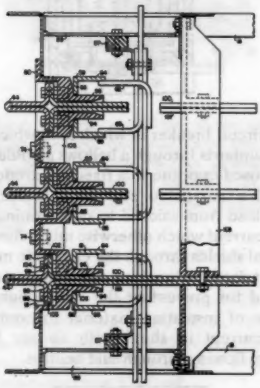
A low profile electromechanical keyboard switch, displaying very low electrical bounce. The switch key top bears against a generally cylindrical plunger which has a depressed flat portion on its side engageable with a tactile ball biased by a spring nested in the switch housing. Upon application of a force to the key top which exceeds a threshold value, the tactile ball is displaced from the flat and over the shoulder defined between the depressed flat and the cylindrical portion of the plunger. Sudden, positive movement of the plunger against an underlying contact leaf ensues. The contact leaf is branched into multiple contact fingers, and arranged with respect to an underlying contact plate so that wiping contact occurs between fingers and plate. The switch housing is configured to carry sufficient diodes and resistors to assure full control and encoding functions in the keyboard in which such switch may be mounted.

3,746,817

METAL-ENCLOSED SWITCHGEAR

John L. Drown, Monroeville, and Howard C. Peppel, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 24, 1972, Ser. No. 256,319
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 K **14 Claims**



Metal-enclosed switchgear unit of standardized dimensions having a front breaker compartment, a rear cable compartment, and an intermediate bus compartment; the front breaker compartment containing a number of stacked subcompartments or chambers in which multipole circuit breakers are disposed; and a partition between the front breaker compartment and the bus compartment which partition includes an insulating supporting structure. At least three main bus bars mounted in the bus compartment and extending horizontally across the switchgear unit and connected respectively to at least three vertical riser conductors for each unit structure in the bus compartment and each riser having a channel-shaped cross section. At least two vertically spaced conductors for each pole of each circuit breaker which conductors extend through and are supported by the insulating supporting structure. Each upper conductor of each pair of vertically spaced conductors for each circuit breaker being connected to a corresponding riser and within the insulating supporting structure. Each lower conductor for each pole of each circuit breaker unit extends through an aperture in the webbed portion of the channel-shaped risers and the insulating supporting structure comprises a sleeve portion extending around each lower conductor and through the aperture in the riser, whereby an insulating barrier is provided between each lower conductor and said riser.

3,746,818

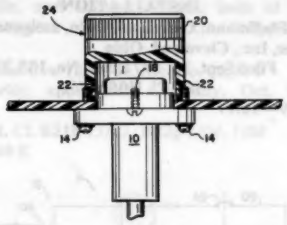
GUARD FOR PREVENTING INADVERTENT OPERATION OF ELECTRICAL SWITCHES

Ansano Bertelloti, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 4, 1972, Ser. No. 295,066
Int. Cl. H01h *9/00*
U.S. Cl. 200—168 H **4 Claims**

A cylindrical guard device for electrical switches, the guard having a plurality of flattened areas on the outer surface at one end thereof. The switch mounting screws and additional guard

mounting screws form a nest for the guard which is inserted with the flattened portions in registration with the screws.



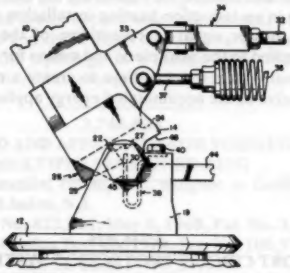
Rotation of the guard wedges the round portions of the guard against the screw threads to thereby secure it in position about the switch actuator.

3,746,819

CONTACT ASSEMBLY FOR SWITCHES

Leonard J. Linde, Brookfield, Wis., assignor to Gulton Industries Inc., Metuchen, N.J.

Filed Aug. 11, 1972, Ser. No. 279,850
Int. Cl. H01h *1/50, 9/60*
U.S. Cl. 200—170 A **15 Claims**



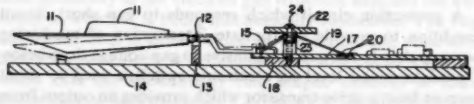
In a high voltage disconnect electric switch, a rotatable switchblade is provided with a contact portion at one end having an edge which is adapted to remain coincident with the axis of rotation of the switchblade throughout the blades rotation. A stationary terminal is maintained in continuous electrical contact with this blade edge. A rotatable contact assembly is also provided receivable of the switchblade and includes a contact portion having an edge adapted to remain coincident with the assembly's axis of rotation. Another stationary terminal is maintained in continuous electrical contact with this contact edge. Both the blade and the contact assembly remain in static contact with respective terminals throughout the rotation of the various members thereby reducing wear and other associated problems.

3,746,820

PRESSURE BOARD FOR THE ELECTRICAL CONTACTS FOR AN ELECTRIC ORGAN

David A. Holder, Jr., 8303 Donoghue Dr., New Carrollton, Md.

Filed Feb. 22, 1972, Ser. No. 228,092
Int. Cl. H01h *1/50;* **G10c** *3/12*
U.S. Cl. 200—170 A **4 Claims**



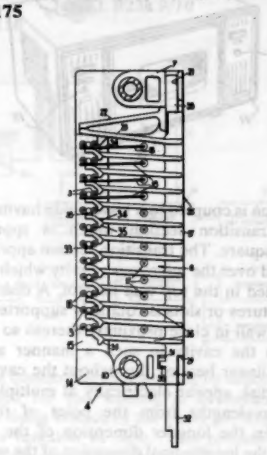
A pressure board which extends over a plurality of flexible contact members so as to apply a positive pressure at the apex of the contact members to insure a firm contact point for the electrical contacts of a keyboard of an electric organ when the organ keys are depressed.

3,746,821

CROSSBAR SWITCH WITH RAMP MEANS FACILITATING CONDUCTOR ASSEMBLY SUBSEQUENT TO HOUSING ASSEMBLY

Michael David Harcourt, Coventry, England, assignor to The General Electric Company Limited. London, England

Continuation of Ser. No. 33,615, May 1, 1970, abandoned.
This application May 26, 1972, Ser. No. 257,351
Int. Cl. H01h *63/33, 63/34, 67/04*
U.S. Cl. 200—175 **3 Claims**



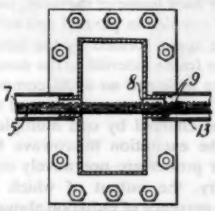
A conductor matrix is located and supported in a housing matrix having guide passages in rows, columns, and tiers so that the conductor matrix can be assembled by longitudinal insertion of row conductive wires and column conductive wires. Comb actuating members are also provided to drive said row conductive wires into contact with said column conductive wires. Said comb and housing members provide ram *p* formations to facilitate assembly of said conductive wires subsequent to assembly of said housing members.

3,746,822

SPLIT FOLDED WAVEGUIDE WITH LEAKAGE PREVENTIVE APERTURES

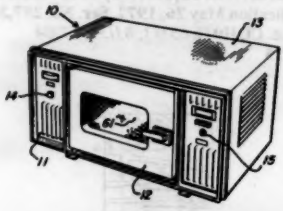
Toai Le Viet, La Tour-de-Peilz, Switzerland, assignor to Societe D'Assistance Technique Pour Produits Nestle S. A., Lausanne, Switzerland

Filed Apr. 23, 1971, Ser. No. 136,727
Claims priority, application Switzerland, May 13, 1970, 7075/70; Feb. 23, 1971, 2556/71
Int. Cl. H05b *9/06*
U.S. Cl. 219—10.55 **2 Claims**



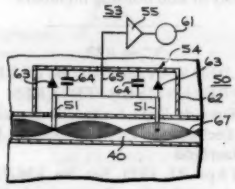
Microwave heating apparatus comprising a conveyor band carrying material through a split folded waveguide comprising straight and curved elements, the slots in the straight elements for the passage of the conveyor having lips which are not more than one-eighth of the wavelength apart.

3,746,823
ELECTRONIC COOKING APPLIANCE
Lloyd L. Whiteley, 15520 Wing Lake Dr., Minnetonka, Minn.
Filed Feb. 28, 1972, Ser. No. 229,790
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **17 Claims**



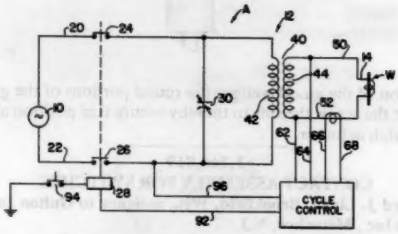
A magnetron is coupled to a wave guide having an open end exciting a transition section which is spproximatelytwo wavelengths square. The transition section approximately two box is secured over the microwave cavity which has a circular opening formed in the top wall thereof. A disk having a plurality of apertures or slots is rotatably supported beneath the upper cavity wall in close proximity thereto so that energy is radiated into the cavity in such a manner as to produce uniform and linear heating throughout the cavity. The apertures in the disk appear electrically at multiples of substantially half-wavelengths from the point of the magnetron coupling when the longder dimension of the apertures are transverse to the longitudinal dimension of the wave guide.

3,746,824
MICROWAVE OVEN LEAKAGE RADIATION DETECTING DEVICE
Richard V. Prucha, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Aug. 7, 1972, Ser. No. 278,570
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 **4 Claims**



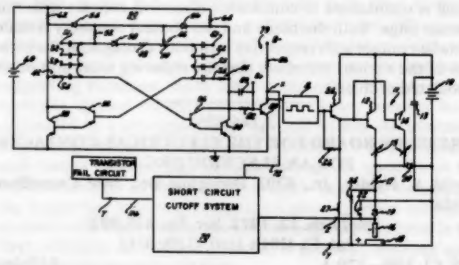
An electronic microwave oven has incorporated therewithin a leakage radiation detecting device for sensing and providing an indication of the presence of radiation escaping from the oven cavity past the door seal gasket. The device, located within the door frame of the oven, includes two metallic sensor probes coupled in parallel and extending in a resonant channel-like space formed by the inner surface of the door and the door frame external to the door seal gasket. The sensor probes are arranged so as to communicate with the electric field of the microwave energy and are longitudinally spaced within the channel by odd multiples of one-quarter wavelength of the excitation microwave frequency of the oven. The sensor probes are operatively coupled to voltage amplifier circuitry, the output of which is coupled to a responder. In the presence of radiation above a predetermined level escaping from the oven cavity, a voltage will be sensed by at least one of the probes and will be amplified by the amplifier circuitry so as to activate the responder, a neon lamp, providing a visible indication of the presence of the leakage radiation in excess of a predetermined level.

3,746,825
SYSTEM AND METHOD FOR MEASURING INPUT ENERGY FOR AN INDUCTION HEATING INSTALLATION
George D. Pfaffmann, Cleveland, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio
Filed Sept. 30, 1971, Ser. No. 185,316
Int. Cl. H05b 1/02
U.S. Cl. 219—10.77 **1 Claim**



A system and method for measuring the energy applied to a workpiece in an induction heating installation which includes creating a power signal representative of the instantaneous power supplied to the workpiece and means for integrating the power signal with respect to time to create a resultant signal representative of the accumulated energy applied to the workpiece.

3,746,826
SHORT CIRCUIT PROTECTION SYSTEM FOR ELECTRICAL DISCHARGE MACHINING POWER SUPPLY APPARATUS
Oliver A. Bell, Jr., Mooresville, N.C., assignor to Colt Industries Operating Corp., Davidson, N.C.
Filed Jan. 19, 1972, Ser. No. 219,022
Int. Cl. B23p 1/08
U.S. Cl. 219—69 S **11 Claims**

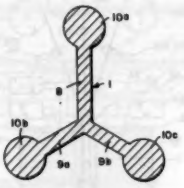


A protection circuit which responds to gap short circuit condition to provide appropriate interruption of machining power pulses to the gap. Responsive to gap voltage drop below a predetermined level an electronic switch is used to shunt current from a drive transistor which provides an output from the pulse generator to interrupt the drive signal output during the continuation of the gap short circuit condition. The circuit includes a field effect transistor and a controlled fast charging network for a capacitor controlling triggering of the transistor.

3,746,827
PROFILED ELECTRODE FOR ELECTRO-EROSIVE BORING

Wilhelm Martin, and Werner Rieger, both of Grebben, Germany, assignors to Glangstaff AG, Wuppertal, Germany

Filed Oct. 15, 1970, Ser. No. 80,974
Claims priority, application Germany, Oct. 18, 1969, P 19 52 587.2
Int. Cl. B21b *13/12*; B23p *1/04, 1/08*
U.S. Cl. 219—69 E 9 Claims

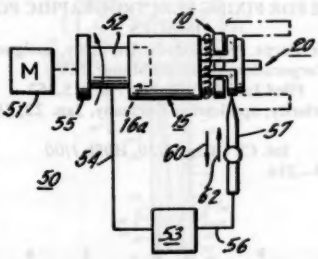


A finely profiled copper electrode for electro-erosive boring having a multi-lobal cross-section of a plurality of radially extending arms having a thickness of less than about 80 microns and terminating within an outer circumference of less than about 600 microns, the electrode being formed by cold rolling a calibrated hard drawn copper wire with the ends of the arms being cut to size and shape. Such electrodes are especially useful in boring the openings in a nozzle plate for spinning profiled filaments of a fibrous polymer.

3,746,828
METHOD AND APPARATUS FOR FORMING A MULTIPLE SECTIONED RING

Leonard D. Minutillo, Parlin, N.J., assignor to Griffiths Electronics, Inc., Linden, N.J.

Division of Ser. No. 822,961, May 8, 1969, Pat. No. 3,562,898.
This application Dec. 23, 1970, Ser. No. 100,929
Int. Cl. B23k *11/10, 37/04*
U.S. Cl. 219—86 4 Claims

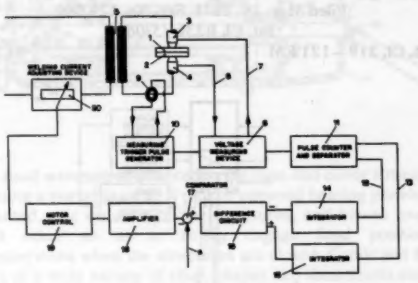


Apparatus for forming a ring structure comprised of a multiple number of elements substantially forming the ring, which sections are utilized in cathode ray guns to provide the electrical circuit for energizing the cathode filaments of the electron gun. Four separate sections form the ring. The apparatus for forming the arrangement is to provide a single stamped member having the thickness of the order of 5 mils and mounting the member upon a jig to form a substantially circular shaped configuration. The member is then positioned in close proximity to the electron gun structure adjacent the elements to which it is being mechanically connected. The ring shaped member is then welded to the supporting structures and, after weldment, is positioned in a ring cutter assembly which cuts the substantially ring shaped member at three points located approximately 120° apart to thereby form four separate elements which are then utilized for electrical connection to filament leads of a plurality of cathode heaters mounted within the electron gun structure. This technique replaces the conventional technique in which six separate elements are utilized to form the filament ring.

3,746,829
PROCESS FOR CONTROLLING SPOT WELDING AND NON-DESTRUCTIVE TESTING OF SPOT-WELDED JOINTS

Jurgen Petzold, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 22, 1971, Ser. No. 117,309
Claims priority, application Germany, Mar. 7, 1970, P 20 10 878.5
Int. Cl. B23k *9/10*
U.S. Cl. 219—110 6 Claims

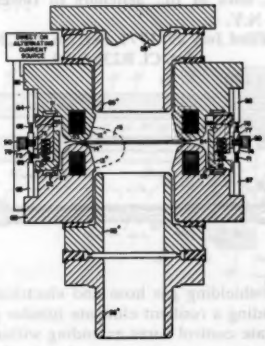


A process for controlling spot welding by adjusting the electric energy used for the welding in accordance with the gradient of the rising branch of the curve plotting the electric resistance as a function of time. This process permits the maintenance of the overall welding time constant. At the same time the process permits non-destructive testing of a spot-welded joint by utilizing the gradient of the rising branch of the curve representing the welding resistance as a function of time. This gradient then indicates the quality of the spot weld.

3,746,830
RECURRENT ARC HEATING SYSTEM

Maurice G. Fey, Turtle Creek; Charles B. Wolf, Irwin; Frederick A. Azinger, Jr., Pittsburgh, and George A. Kemeny, Export, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 790,417, Jan. 10, 1969, Pat. No. 3,629,553. This application Mar. 15, 1971, Ser. No. 124,517
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P 2 Claims



Gas or fluid flows through a gap between electrodes having an arc therebetween at a very high velocity while a system voltage is continuously maintained sufficient to cause breakdown at the gap. The high velocity gas elongates the arc until the arc voltage required for electrical conduction exceeds the breakdown voltage of the gap whereupon sparkover occurs in the gap, the arc being thereafter elongated again by the gas

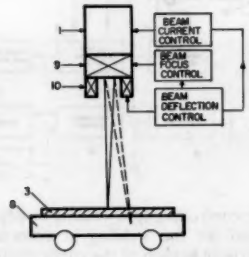
passing through the gap until the voltage required to sustain arcing exceeds the breakdown voltage of the gap, the cycle of gap breakdown and elongation being repeated over and over again. The greatly extended arc provides for more efficient heating of the gas, better mixing and a more uniform temperature to which the gas is heated.

3,746,831

METHOD FOR ELECTRON BEAM WELDING AT HIGH SPEEDS

David Sciaky, Chicago, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed Mar. 29, 1971, Ser. No. 129,000
Int. Cl. B23k *15/00*
U.S. Cl. 219—121 EM **9 Claims**



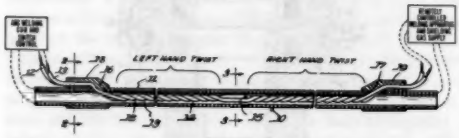
The invention concerns a process of welding by an electron beam. The process is one of electron beam welding in which an electron beam is oscillated locally in a direction along a desired path on the work so as to determine a zone over which the beam is swept upon the work pieces which zone has a trailing edge at one end directed in the direction of the relative displacement of the parts with respect to the gun and a leading edge at its other end directed in the opposite direction to the relative displacement and where the power density of the beam is made to vary in a desired manner. For example, it may be reduced when it is abreast of the trailing edge of the swept zone with respect to the power density when the beam is abreast of the loading edge of the swept zone.

3,746,832

ARC WELDING GUN UNITIZED GAS HOSE AND ELECTRICAL CONTROL CORD

Arthur A. Bernard, Beecher, and Richard A. Bernard, Flossmoor, both of Ill., assignors to Dover Corporation, New York, N.Y.

Filed July 29, 1971, Ser. No. 167,306
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **7 Claims**



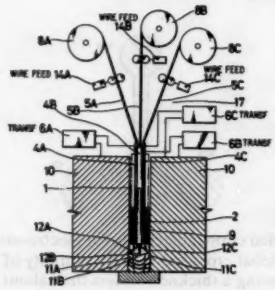
A unitized shielding gas hose and electrical control cord conduit including a resilient elongate tubular gas hose and a pair of elongate control wires extending within the gas hose. The control wires are twisted together in the gas hose alternately in right and left-hand twist directions to be free to untwist and extend when the conduit is stretched and tend to rewind when the stretch force is removed. Means are also disclosed forming a seal between the control wires and the wall of the gas hose at the entry of the control wires into the gas hose and at the exit of the control wires from the gas hose.

3,746,833

PROCESS AND APPARATUS FOR TRIPLE-ELECTRODE MIG WELDING USING SHORT-CIRCUIT AND SPRAY-ARC DEPOSITION

Akira Ujiie, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1972, Ser. No. 226,055
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **4 Claims**



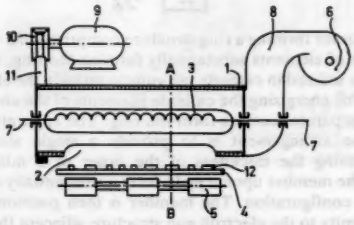
A triple-electrode MIG welding process for the butt welding of I-grooves in flat position which comprises arranging three electrodes at the apices of a triangle, two of the electrodes preceding with a short-arc characteristic and one following said two with a spray-arc characteristic, and causing the two preceding electrodes to weld the groove walls by fillet welding while causing the following one electrode to weld and fill up the space between the beads formed by fillet welding, so that one weld layer is formed by three passes.

3,746,834

DEVICE FOR FIXING ELECTROGRAPHIC POWER IMAGES

Heinz-Dieter Purps, Norderstedt, Germany, assignor to U.S. Phillips Corporation, Briarcliff Manor, N.Y.

Filed Jan. 4, 1972, Ser. No. 215,352
Claims priority, application Germany, Jan. 22, 1971, P 21 02 949.2
Int. Cl. G03g *13/20*; H05b *1/00*
U.S. Cl. 219—216 **9 Claims**

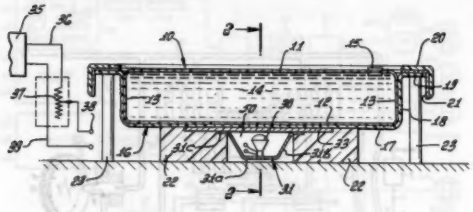


The invention relates to a device for thermal fixation of electrographic powder images on carriers of arbitrary quality and thickness. The device comprises a thermal radiator having a mechanical radiation shutter in the form of a rotatable cylindrical reflector provided with a bar-shaped radiator in the focal point for selective radiation of given areas of the carrier.

3,746,835
ELECTRIC BULB HEATED WATER BED SYSTEM

Ying-Nien Yu, Marina Del Rey, and William Pennington, Palos Verdes Peninsula, both of Calif., assignors to Ying-Nien Yu, Marina Del Rey, Calif.

Filed Aug. 20, 1971, Ser. No. 173,563
Int. Cl. H05b 1/00
U.S. Cl. 219—217 9 Claims



A liquid bed system comprises:

a. a flexible hollow enclosure to receive liquid and having a substantially flat top sized to receive a reclining sleeper, and

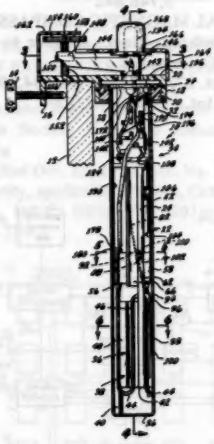
b. radiant heat producing bulb means located and directed in such proximity to the enclosure as to transmit heat for transfer to liquid therein thereby to maintain the liquid temperature at a level comfortable to the sleeper.

Also, a flange on the enclosure (in the form of a tray) may transmit imposed loading directly to supports, independently of the remainder of the tray.

3,746,836
AQUARIUM HEATER

William F. Summerfield, and Fleet E. Nuttall, Hermosa Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 15, 1971, Ser. No. 208,095
Int. Cl. F24b 1/00
U.S. Cl. 219—328 17 Claims

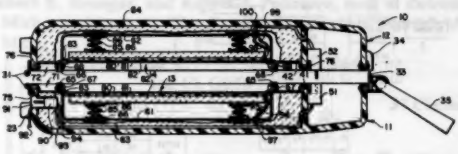


An aquarium heater comprising a housing, or heater tube, in which is provided heating coils for heating the housing to a temperature higher than ambient temperature. Extending in the housing is an appropriate electral circuit for providing electrical current to the heating coils. A pair of independently actuable thermostats are operatively associated with the eletrical circuit, each for independently opening and closing the circuit selectively in response to respective external temperature levels, one of which is a safety switch for preventing the heater tube from overheating.

3,746,837
FOOD WARMING APPLIANCE

Irwin Kenneth Frey, P.O. Box 4836, Fairview Park, Ohio, and Charles L. Zola, 24619 Royalton Rd., Columbia Station, Ohio

Filed July 18, 1972, Ser. No. 273,013
Int. Cl. F27d 11/02
U.S. Cl. 219—387 14 Claims



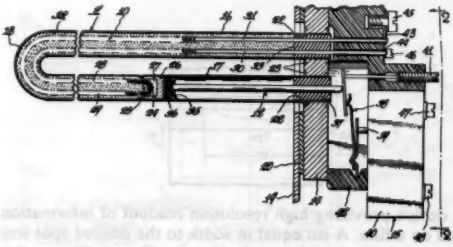
A food warming appliance having base and cover structures defining a portable case. A pair of opposed heating panels are mounted, one on each of the structures, and biased toward each other so as to firmly engage food positioned therebetween when the structures are closed. Foods and food trays of a wide variety of sizes, shapes and thicknesses can be positioned between the panels and firmly gripped so as to be warmed through a gentle conductive heat transfer. The heating compartment is well insulated and has the capability of serving as a cold food storage area to keep frozen foods frozen for substantial periods of time. A safety electrical interlock system normally de-energizes the heating panels when the appliance is open. An interlock by-pass plug and cord permit open case operation where the appliance is to be used to keep foods warm during serving.

A supporting rack structure is provided for receiving and energizing a plurality of such appliances. Selection switches permit selection of one of several predetermined food serving times. Methods of warming foods for consumption by an individual or large numbers of people through use of such appliances and supporting rack structures are described.

3,746,838
ELECTRIC HEATING ELEMENTS

Lester D. Drugmand, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 869,215, Oct. 24, 1969, Pat. No. 3,585,359. This application Nov. 25, 1970, Ser. No. 92,867
Int. Cl. H05b 1/02
U.S. Cl. 219—512 5 Claims

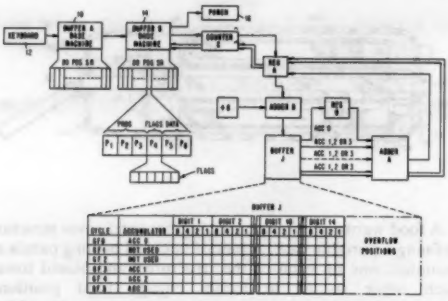


A metallic sheathed electric heating element, particularly of hairpin formation, wherein a heat responsive device forms part of the element and comprises a metal rod contained within the sheath and having its inner end affixed thereto, the rod and sheath having different thermal expansion properties whereby the rod may operate a switching device.

3,746,839
ACCUMULATOR FOR A KEY ENTRY DEVICE

John Lettieri, Woodstock, N.Y., and Roger H. E. Pett, Scarborough, Ontario, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1971, Ser. No. 193,827
Int. Cl. G06f 5/02, 7/50; G06k 1/00
U.S. Cl. 235—61.6 R 2 Claims

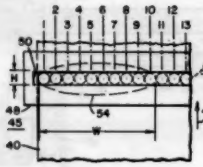


This specification describes an accumulator for a key entry device which has a shift register buffer memory that holds a character entered from a keyboard. The accumulator performs computation on the data on punch cards used by the key entry device. These computations can include the addition or subtraction of data in two or more numeric fields to be punched on the same card to provide a total that is punched out in a third numeric field on that same card or can include the computation of a running or hash total of the same numeric field on a number of different cards forming a group or batch of cards. The accumulator comprises a counter for converting the ten numeric bits of the serial Hollerith code used in punching data onto cards to four parallel BCD bits used in performing addition or subtraction with the data, a buffer for storing the accumulated total in BCD and a plurality of single bit adders and registers for performing the addition on data to be added to or subtracted from the accumulated total.

3,746,840
RESOLUTION IMPROVEMENT FOR OPTICAL SCANNERS

Jon W. Ogland, Glen Burnie, and Edward C. Malarkey, Severna Park, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 2, 1970, Ser. No. 51,962
Int. Cl. G03b 27/00; G06k 7/10
U.S. Cl. 235—61.11 E 8 Claims

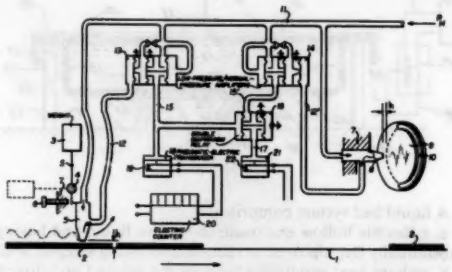


A device providing high resolution readout of information stored on a film. A slit equal in width to the desired spot size diameter is placed in front of a moving film. A fiber optics strip is placed in back of the film in line with the slit. A beam of light scans across the slit. The fiber optics strip is comprised of a plurality of optic fibers. The width of each fiber is also equal to the desired spot size diameter. All of the optic fibers are connected to a small group of photodetectors. The fibers and the detectors are arranged in such a manner that no one detector will receive information from more than one fiber at any one time as the beam scans across the slit.

3,746,841
METHOD AND APPARATUS FOR INITIATING COUNTING AND/OR DISCONNECTING PROCESSES, IN PARTICULAR FOR PRINTING PRESSES

Horst Fenske, Leipzig, Germany, assignor to VEB Polygraph Leipzig, Wachsmuthstrasse, Leipzig, Germany

Filed July 6, 1971, Ser. No. 160,004
Int. Cl. G06m 7/02
U.S. Cl. 235—92 PK 5 Claims

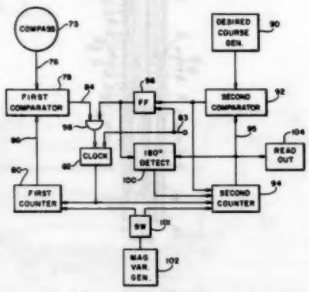


A method of initiating and an apparatus for counting and/or disconnecting operations, particularly for printing presses, variations in pressure of an outlet nozzle arranged above a conveyor belt being evaluated for the contact-less evaluation of sheet products or the like moved on a conveyor belt and converted by a pneumatic-electric transducer into electric pulses, which comprises the steps of directing a jet stream against a perforated disc moved in synchronism with the machine and comparing variations in pressure head of two outlet nozzles, then feeding only the result of the comparing step to a pneumatic-electric transducer, is fed and is evaluated by a second pneumatic-electric transducer the result of the variations in pressure head in the first outlet nozzle.

3,746,842
DIGITAL MAGNETIC COMPASS

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Sept. 27, 1971, Ser. No. 184,003
Int. Cl. G06m 1/272
U.S. Cl. 235—92 CV 10 Claims



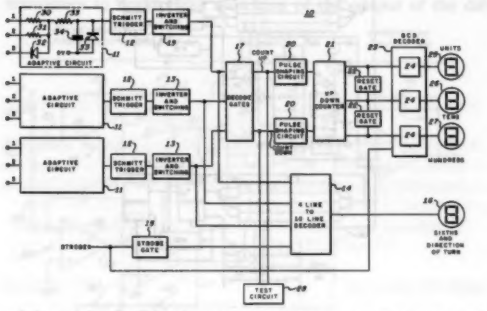
A magnetic compass in which the compass card and gimbal mounting are all located inside a sealed enclosure filled with damping fluid. The compass card is digitally coded and photoelectric means are provided for reading the card and generating a digital number corresponding to the rotational position of the card relative to the enclosure, corrected for local magnetic variation. Means are provided for comparing the compass reading with the corrected course reading to provide an error signal or an off-course alarm if desired.

3,746,843

DIGITAL COMPASS REPEATER READOUT DEVICE

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 15, 1970, Ser. No. 98,220
Int. Cl. G06m 3/06
U.S. Cl. 235—92 EA 9 Claims



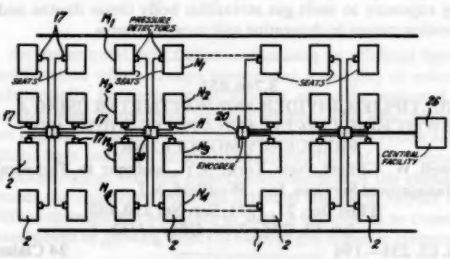
A solid state digital readout device for use with gyrocompass step data in the form of either current sinking logic or current sourcing logic. The input data is waveshaped in a plurality of parallel connected Schmitt trigger circuits and coupled through inverter and switching circuits to decode gates connected in parallel with an integrated circuit decoder unit. Outputs from the decoder unit are coupled to a segmented display which provides a visual indication of direction of turn in accordance with the clockwise and counterclockwise sequential illumination of the segments and a visual indication of heading in sixths of a degree. The decode gates provide count up pulses or count down pulses for each degree of rotation in accordance with heading. These pulses are summed in an up/down counter which has its outputs coupled through a binary coded decimal decoder and applied to a display unit which indicates heading in degrees.

3,746,844

APPARATUS FOR DETERMINING THE CENTER OF GRAVITY OF PASSENGERS IN A VEHICLE, NAMELY AN AIRCRAFT

Jacques Azum, and Roger Claustre, both of Toulouse, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Oct. 13, 1971, Ser. No. 188,734
Claims priority, application France, Oct. 22, 1970, 7038138
Int. Cl. G06g 7/70; G01m 1/12
U.S. Cl. 235—150.2 6 Claims



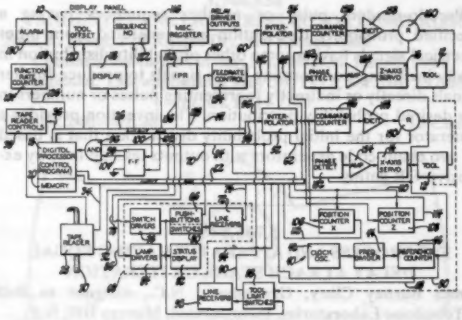
The invention is concerned with an apparatus for determining the center of gravity of a group of objects which are distributed randomly in the squares of a two dimensional grid system having an arbitrarily chosen origin. Each object is detected and two electrical signals are generated for each detected object a first signal having a constant strength and length and a second signal having a constant strength and length proportional to the distance from the origin of the object. The sum of the first signals is representative of the total weight of the objects and the sum of the second signals is representative of the sum of the moments of the objects about the origin. The quotient of the two sums is measured and represents the center of gravity of the objects relative to the origin.

3,746,845

NUMERICAL CONTROL SYSTEM

Hubert B. Henegar, and Robert J. Patterson, both of Detroit, Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 6, 1970, Ser. No. 62,244
Int. Cl. G05b 15/02
U.S. Cl. 235—151.11 37 Claims



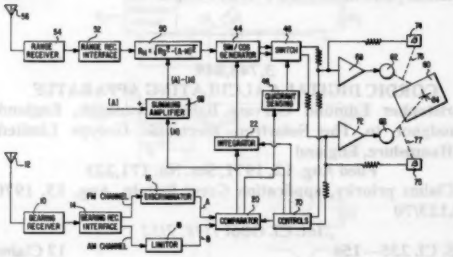
A numerical control system for controlling the motion of a movable member wherein part program and other data flows throughout the system under control of a programmable digital processor. Selected devices present interrupt signals indicating data flow conditions according to an order of priority determined by external wiring; the highest priority being assigned to part program reading and the lowest priority being assigned to the scanning of certain hard contacts such as control panel switches. Interface logic between input and output devices and the processor is disclosed.

3,746,846

POLAR TO RECTILINEAR CHART SYSTEM

Vernon I. Weihe, Arlington, Va., assignor to Vega Precision Laboratories, Incorporated, Vienna, Va.

Filed Apr. 1, 1971, Ser. No. 130,323
Int. Cl. G06g 7/78
U.S. Cl. 235—150.27 14 Claims

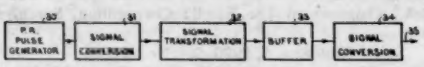


A system which employs electro-mechanical and electronic hybrid (analog/digital) semi-conductor techniques to select a desired chart for display and to position a symbol thereon to conform with an operator referenced zero point and a polar vector (angle and distance) input.

3,746,847
GENERATING PSEUDO-RANDOM SEQUENCES

Dimitris Maritsas, 73 Palatine Rd., Manchester 20, England

Filed June 10, 1971, Ser. No. 151,736
Claims priority, application Great Britain, June 16, 1970, 29,067/70
Int. Cl. G06f 1/02, 7/38
U.S. Cl. 235—152 14 Claims

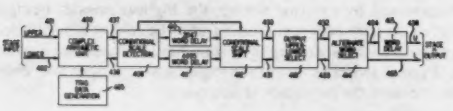


Pseudo-random pulse or number sequences having a specified probability distribution are generated from other electrical signals having some other probability distribution in a way including transforming those signals to produce further signals directly or indirectly representing pulses or numbers in the desired probability distribution. The invention provides a generator for the initial probability distribution that is based on two chain-code generators with outputs taken jointly by exclusive-OR gating.

3,746,848
FFT PROCESS AND APPARATUS HAVING EQUAL DELAY AT EACH STAGE OR ITERATION

James Barney Clary, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1971, Ser. No. 212,573
Int. Cl. G06f 7/38
U.S. Cl. 235—156 8 Claims



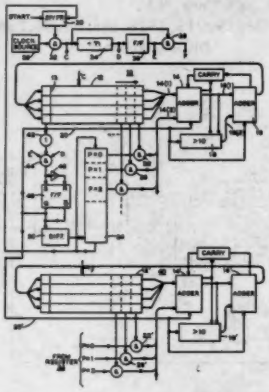
Methods and apparatus for performing a sequential or cascaded version of the fast Fourier transform are described. A uniform set of delays are introduced in the described methods and apparatus, thereby permitting substantially identical apparatus to be used for each iteration. Unique data formatting and channeling arrangements permit high circuit efficiency and minimized overall complexity.

3,746,849
CORDIC DIGITAL CALCULATING APPARATUS

Christopher Edmund Gervase Bailey, Cranleigh, England, assignor to The Solartron Electronic Groups Limited, Hampshire, England

Filed Aug. 12, 1971, Ser. No. 171,223
Claims priority, application Great Britain, Aug. 13, 1970, 39,123/70
Int. Cl. G06f 7/48, 7/52
U.S. Cl. 235—156 12 Claims

Digital calculating apparatus, comprising two shift register stores with each store connected in a recirculating circuit loop which includes means for changing a number in one store by an arithmetic progression, typically linear or exponential. Initial values are entered in both stores and successive recirculations of digital data are effected in each loop in a manner which causes one loop to undergo a plurality of N addition or subtracting cycles, and also causes the other loop to undergo a plurality of M recirculating cycles where M is equal to or less than N. Through recirculation in the manner described, one of

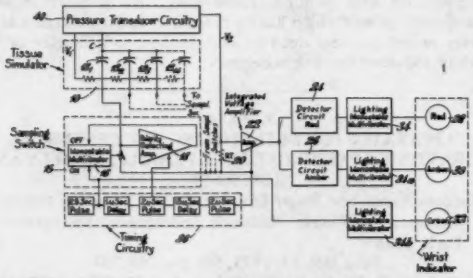


the stores converges upon a predetermined final value and the desired answer in digital form may then be obtained from the other store.

3,746,850
DIVER DECOMPRESSION APPARATUS

Jimmy J. Moore, 1010 North Main, Elgin, and Allen C. Ward, 615 East Wonsley Dr., No. 114, both of Austin, Tex.

Filed Sept. 9, 1971, Ser. No. 179,113
Int. Cl. G06g 7/60
U.S. Cl. 235—184 3 Claims



A diver decompression apparatus for indicating the safe ascent criterion for returning from the ocean depths to the surface, comprising a body tissue simulator, means for sampling exposure to inert gas at various body tissue depths and indication means to determine safe ascent criteria.

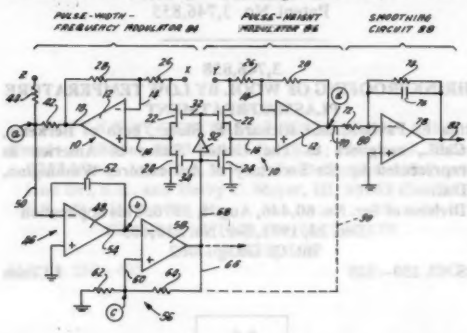
3,746,851
MULTIPLIER, DIVIDER AND WATTMETER USING A SWITCHING CIRCUIT AND A PULSE-WIDTH AND FREQUENCY MODULATOR

Roswell W. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.

Filed Dec. 21, 1971, Ser. No. 210,456
Int. Cl. G06g 7/16; G01r 11/32
U.S. Cl. 235—194 24 Claims

In the switching circuit, the output signal from a high-gain differential amplifier is caused to reverse polarity by means of the switching of a pair of field-effect transistors. A resistor is connected in series with the inverting lead of the differential amplifier, and a signal source is connected to the resistor at an input terminal. The field-effect transistors are used to connect the non-inverting lead of the differential amplifier alternately between the input terminal and ground. This causes the amplifier output to reverse polarity, and thus provides a very accu-

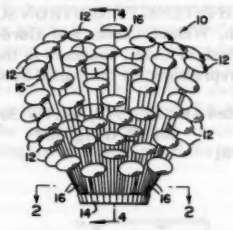
rate, low-offset means of switching the output of the amplifier The switching circuit is used in a modulator which permits output pulses to be modulated in width and/or frequency. The reversible output signals of the switching circuit are added to the modulating input signal and the sum is integrated. A level detector changes the polarity of its output voltage whenever the output of the integrator reaches either of two fixed levels. The output of the level detector is used to drive the field-effect transistors to control the switching of the output of the differential amplifier. Such a pulse-width modulator is used to drive a pulse-height modulator so as to form a multiplier. The multiplier can be used to great advantage as a wattmeter by supplying load current and voltage signals to the pulse-width and pulse-height modulators so as to multiply the load current and voltage by one another. The same device can be used as a divider by holding either one input to the pulse-width modulator or the input to the pulse-width modulator constant, while allowing the other of those inputs to be variable and the input to the switching circuit to be the other variable.



3,746,852
CANDLE CANOPY

Mary Louise Beaudin, 3121 Bahia Vista, Sarasota County, Fla.

Filed June 23, 1971, Ser. No. 155,817
Int. Cl. F21p *1/02*
U.S. Cl. 240—10 R **5 Claims**



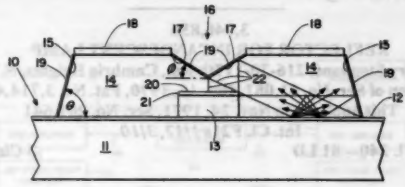
An ornamental light fixture comprising an aritficial light in combination with a canopy comprising a plurality of colored, substantially hemispherically shaped elements mounted on flexible wire supports of varying lengths. The wire supports are attached to a base which is adapted to hold or retain an artificial light source. The smooth undersurface of the elements in combination with the convex outersurface of the elements causes the light rays from the artificial source to refract and diffuse through the elements in such a manner as to create a translucent or glowing effect in each of the separate elements.

3,746,853
LIGHT EMITTING DEVICES

Karel Jan Williams Kosman; Louis-Philippe Boivin, and Dennis Effer, all of Ottawa, Ontario, Canada, assignors to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Mar. 10, 1972, Ser. No. 233,674
Int. Cl. F21v *7/00*
U.S. Cl. 240—41.35 D **3 Claims**

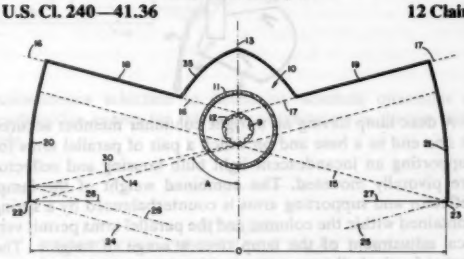
Light emitting arrays in which the light source is positioned between two opposed reflector surfaces. The light from the source is reflected back past the source by a first reflector and then re-reflected by a second reflector back past the light source to the first reflector. A very thin assembly is obtained. The arrangement is particularly suitable for light emitting diodes and can be used for character displays.



3,746,854
TANGENT PLANE LIGHT REFLECTOR LUMINAIRE

John R. Brass, 170 Knight Dr., San Rafael, Calif.

Continuation-in-part of Ser. No. 881,834, Dec. 3, 1969, abandoned. This application May 30, 1972, Ser. No. 257,809
Int. Cl. F21v *7/09*
U.S. Cl. 240—41.36 **12 Claims**

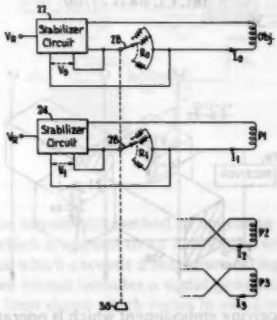


A tangent plane light reflector principle for use in the design of luminaires is disclosed. Luminaires embodying the tangent light plane principle are described. The design and fabrication of luminaires embodying the tangent light plane principle for specific applications are discussed.

3,746,855
ELECTRON MICROSCOPES

David Henry Hilditch, Isle of Skye, Scotl ,nd, assignor to Associated Electrical Industries Limited, London, England

Filed Oct. 27, 1971, Ser. No. 192,856
Claims priority, application Great Britain, Oct. 28, 1970, 51,190/70
Int. Cl. H01j *37/26*; G01n *23/04*
U.S. Cl. 250—49.5 A **7 Claims**



In an electron microscope comprising an electromagnetic objective lens and at least three separate electromagnetic projector lenses, the rotations produced by the lenses are mutually balanced out, so that the final image has a substantially constant orientation with changes in magnification. Preferably, magnification is set by a single control knob.

Preferably, the microscope has two modes of operation, for different magnification ranges, the rotations being balanced out in both ranges.

3,746,856

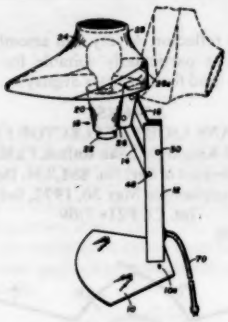
REFLECTOR FOR INCANDESCENT LAMP

J. Larry Stephans, 216-30-117th Rd., Cambria Heights, N.Y.

Division of Ser. No. 81,081, Oct. 15, 1970, Pat. No. 3,714,418. This application Nov. 24, 1971, Ser. No. 201,641

Int. Cl. F21s *1/12, 3/10*

U.S. Cl. 240—81 LD **3 Claims**



A desk lamp having an upright columnar member secured at one end to a base and on which a pair of parallel arms for supporting an incandescent light bulb housing and reflector are pivotally mounted. The combined weight of the lamp, reflector and supporting arms is counterbalanced by a spring contained within the column, and the parallel arms permit vertical adjustment of the lamp over a range of heights. The socket for the bulb is contained within a cup which also houses a dimmer circuit, the control for which depends from the bottom of the cup. A reflector secured to the cup is shaped and positioned relative to the bulb so as to intercept and deflect light downwardly and forwardly over a generally semi-circular area in front of the base. The combination of vertical adjustibility, light intensity control and reflector shape provides a wide range of light intensity over a working zone of adjustable area.

3,746,857

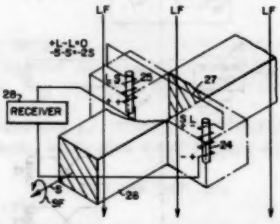
SIGNAL RECEIVING APPARATUS FOR A VEHICLE CONTROL SYSTEM

Robert C. Hoyler, Pittsburgh; Brian R. Slattery, Turtle Creek, both of Pa., and George M. Thorne-Booth, Tarzana, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 28, 1971, Ser. No. 147,806

Int. Cl. B61l *21/00*

U.S. Cl. 246—36 **5 Claims**



A signal receiving embodiment which is operative in a vehicle control system includes a conductive track with a pair of conductive continuous rails. At least one conductive member is connected between the rails, and a plurality of signals are present in the rails, only one signal of which is desired to be sensed. The signal receiving embodiment includes at least one signal receiving means which is aligned in a predetermined position relative to the rails such that potentials induced in the signal receiving means by the desired signal are in a series aiding relationship whereas there is no potential induced by the undesired signals or if signal potential is induced by the undesired signals, the induced signal potential is in a series opposing relationship relative to the signal receiving means.

ERRATUM

For Class 250—49 see:
Patent No. 3,746,855

3,746,858

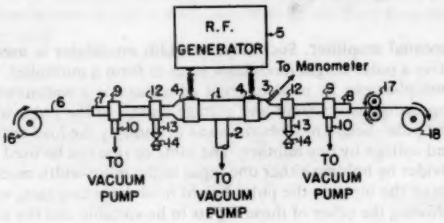
SHRINKPROOFING OF WOOL BY LOW TEMPERATURE PLASMA TREATMENT

Attila E. Pavlath, and Richard F. Slater, both of Berkeley, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 60,446, Aug. 4, 1970. This application Dec. 21, 1971, Ser. No. 210,419

Int. Cl. G03g *15/02*

U.S. Cl. 250—325 **1 Claim**



Method and apparatus for shrinkproofing fibrous material of animal origin—e.g., wool, mohair, and the like—wherein the fibrous material is subjected to a low temperature plasma created by a high-frequency electrical discharge.

3,746,859

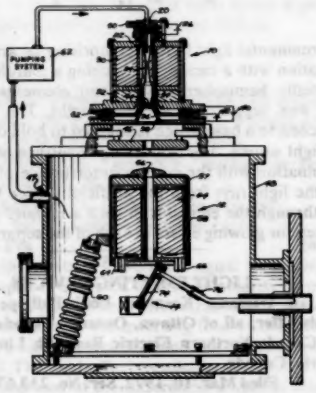
HIGH INTENSITY NEUTRON SOURCE

John L. Hilton, Walnut Creek, and Gordon W. Hamilton, Livermore, both of Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 22, 1970, Ser. No. 30,724

Int. Cl. G21g *3/04*

U.S. Cl. 250—501 **2 Claims**



Disclosed is a neutron generator in which a gas (such as a heavy isotope of hydrogen) or a mixture of gases, is ionized by

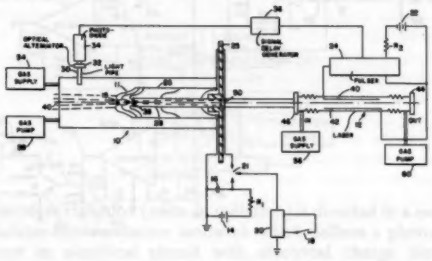
any convenient means such as exposure to a magnetically stabilized arc. The ions are directed to an accelerator and the resulting high velocity ion stream is caused to impinge on a target. The interaction of the ion beam with the target material soon builds up a high density of gas in the target surface which, in turn, interacts with the incoming beam to produce an intense isotropic neutron output from the fusion of the isotopes.

3,746,860

SOFT X-RAY GENERATOR ASSISTED BY LASER

Romas A. Shatas, 8003 Naulas Dr., S.E.; Thomas G. Roberts, 2712 Master Lake Rd., N.W.; John D. Stettler, 410 Cumberland Dr., S.E., and Harry C. Meyer, III, 10002 Conrad Dr., S.E., all of Huntsville, Ala.

Filed Feb. 17, 1972, Ser. No. 227,177
Int. Cl. G21g *3/00*
U.S. Cl. 250—402 **1 Claim**



A high desnity pulsed plasma generator is disposed in axial alignment with a high energy pulse laser to receive laser radiation from the laser axially to the movement of the plasma blob along the centterline of the center electrode of the plasma gun. A high Z-material is disposed between the laser output and the plasma for evaporation by the laser and subsequent injection of heavy z-ions into the plasma for enhancing x-ray radiation from the plasma. Electrrical circuit means is provided for energizing the plasma gun and the laser at predetermined times.

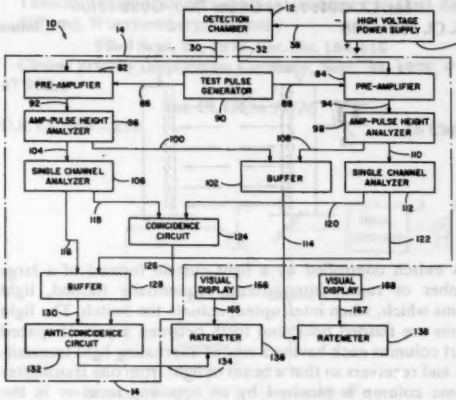
3,746,861

METHODS AND APPARATUS FOR MONITORING SIMULTANEOUSLY TWO ENERGY LEVELS OF RADIOACTIVITY IN A GAS

Preston L. Gant, 705 Red Oak; Bill G. Motes, 3200 N. 14th St., both of Ponca City, Okla., and Robert S. Brundage, 6904 W. Conifer Ln., Las Vegas, Nev.

Filed Dec. 23, 1970, Ser. No. 100,995
Int. Cl. G01t *1/18*; H01j *39/28*
U.S. Cl. 250—83.6 FT **10 Claims**

Method and apparatus for detecting, distinguishing and indicating low-level activity of radioactive gases, such as tritium and/or krypton-85, in a selected gas, even in the presence of electronegative gases. The apparatus consists of a detection chamber of a type which is energy selective through inclusion of plural ionization collector circuits providing two separate detector outputs. The two detector outputs are applied then to parallel signal processing channels which serve to separate detected energy through pulse amplitude discrimination and/or



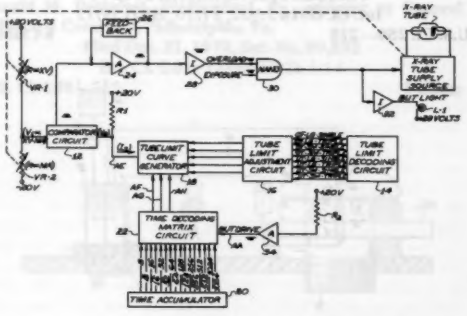
coincidence selection to determine absolute quantities of radioactive events for selected contaminants in the gas sample.

3,746,862

PROTECTIVE CIRCUIT FOR X-RAY TUBE AND METHOD OF OPERATION

Daniel F. Lombardo, Cleveland, and Walter E. Splain, Woodbridge, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 30, 1970, Ser. No. 93,913
Int. Cl. H05g *1/26*
U.S. Cl. 250—409 **31 Claims**

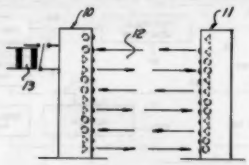


A protective circuit and method of operation for interrupting a signal which is applied to an X-ray tube when the signal attains a value which exceeds a maximum rating for the tube. The protective circuit includes a signal generating circuit for developing a limit signal which varies in value with respect to time in accordance with a maximum tube rating signal, a programming circuit for developing a program signal having a value representative of a preselected signal to be applied to the X-ray tube, and a comparator circuit for developing an interrupt signal if the program signal exceeds the value of the limit signal.

3,746,863
LIGHT CURTAIN CONTROL FOR A SWITCH

Jacques O. Pronovost, Guelph, Ontario, Canada, assignor to Exotron Industries, Ltd., Guelph, Ontario, Canada

Filed Mar. 15, 1972, Ser. No. 234,953
Int. Cl. G01t 1/16; G06m 7/00; G08b 13/00
U.S. Cl. 250—208 **7 Claims**

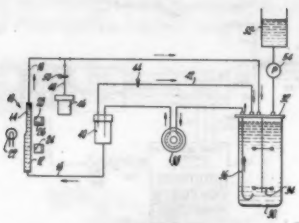


A switch controlled by a light curtain formed of a large number of rapid, intermittent, sequentially flashed, light beams which, when interrupted, actuate the switch. The light beams are flashed back and forth between a pair of spaced apart columns each having a row of alternating light transmitters and receivers so that a beam of light from one transmitter of one column is received by an opposing receiver in the second column, in turn causing the next transmitter in the second column to send a beam of light to the next receiver in the first column, and so on back and forth to the ends of the columns and then repeating the same cycle again. When any of the beams of light is interrupted, as by inserting a physical object in its path, the switch is actuated. By arranging the transmitters and receivers, in each column, in pairs (i.e., two transmitters, then two receivers, etc.) and connecting them into odd and even, sequentially operated, rows in each column, the light beams may be relatively wide or non-sharply focused, so that the operation of the system, is relatively uneffected by misalignment.

3,746,864
DEVICE FOR SENSING AND CONTROLLING OPTICAL DENSITY

Sanford J. Tick, Millington, N.J.; Gunter Zweig, Syracuse, and William L. Emeny, Jr., Fabius, both of N.Y., assignors to New Brunswick Scientific Co., Inc., New Brunswick, N.J.

Filed Jan. 3, 1972, Ser. No. 214,901
Int. Cl. G01n 21/22, 21/26; H01j 39/12
U.S. Cl. 250—218 **8 Claims**

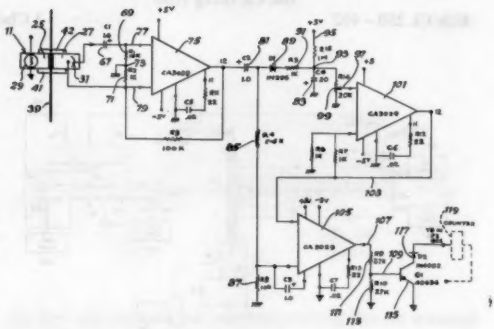


A device for sensing and controlling optical density of a fluid. The device includes a pair of tube portions of different cross-sectional areas through which the fluid flows, these tube portions having walls which are transparent and which are of equal optical characteristics. A light source is provided on one side of the tube portions for directing light transversely through the fluid which flows through the tube portions, and on the other side of the tube portions there are a pair of photocells which respetively receive the light, so that one of the photocells receives light which travels through the tube portion of larger cross-sectional area with a longer path of travel through the fluid than the light received by the other of the photocells. As the optical density of the fluid increases the differential in the light received by the photocells will also increase, and this differential can be detected for achieving desired controls. The light which reaches the photocell receiving the light which has travelled through the tube portion of smaller cross-sectional area is maintained at a constant intensity by an adjacent third photocell.

3,746,865
THREADLINE DEFECT DETECTOR

James L. Burch, Tiverton, Ontario, Canada, assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed July 6, 1971, Ser. No. 160,017
Int. Cl. G01b 7/12
U.S. Cl. 250—219 S **2 Claims**



A detector for indicating the presence of partially broken, frizzed or knotted sections of threadlines, such as may occur during fiber forming operations, includes a housing, a lamp for directing light onto a rapidly moving threadline, a photoelectric cell for receiving such light and generating an electrical signal in response to it, guide means for snubbing the moving threadline and maintaining it in substantially constant positional relationship with the light, and an electronic signal amplification circuit in the housing, utilizing controlled capacitive buildup and decay of electronic signals responsive to those from the photoelectric cell, with the controlled buildup and decay being such that breaking of thread filaments, frizzing or knotting occuring over a length of from 2 to 50 times the width of the threadline actuates a counter, marker, cutter, visual or audio signal or other indicator or responsive device when the broken filaments are of a thickness from 1 to 30 percent of the threadline.

Other aspects of the invention include the mechanical structure of the detector, electronic circuitry and use of the device.

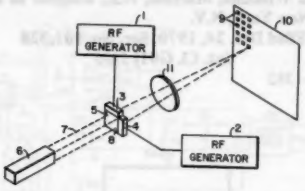
3,746,866
ACOUSTO-OPTICAL SYSTEMS

John D. Feichtner, Murrysville; Milton Gottlieb, Pittsburgh, and George W. Roland, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1971, Ser. No. 209,849
Int. Cl. H01j 1/62
U.S. Cl. 250—372 **27 Claims**

An acousto-optical system which diffracts or modulates light passing through a crystal of Tl_3AsSe_3 by means of sound waves in the crystal is disclosed. Sound waves are generated in

the crystal by means of a transducer connected to an RF generator. The acousto-optical system may be in the form of a



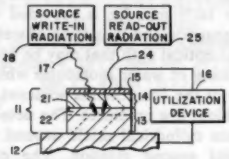
display device, a laser modulator, or other devices. An acoustic delay line using a crystal of Tl_3AsSe_3 is also disclosed.

3,746,867

RADIATION RESPONSIVE SIGNAL STORAGE DEVICE

Robert J. Phela, Jr., and John O. Dimmock, both of Concord, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 777,337, Nov. 20, 1968, abandoned.
This application Apr. 19, 1971, Ser. No. 135,477
Int. Cl. G11c *11/44*; H01j *39/12*; H01l *11/00*
U.S. Cl. 250—209 **25 Claims**



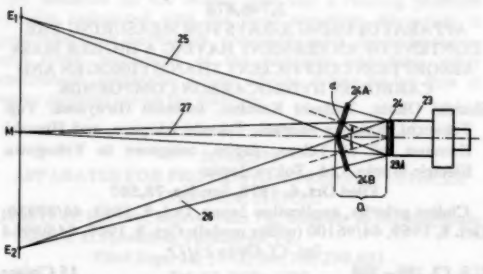
Incident radiation (write-in radiation) is directed to a metal-insulator-semiconductor sandwich which defines a photo-detector in electrical circuit with electrical charge storage means, so that the amount of charge stored by the sandwich is changed, causing a change in the electrical response of the sandwich to other radiation (read-out radiation) directed thereto. Thus, invormation represented by the write-in radiation is stored by the sandwich and later this stored information is read out by noting the electrical response to the read-out radiation.

3,746,868

CORRECTION APPARATUS FOR OPTICAL READING MECHANISM

Johann Plocki, Unterhaching, Germany, assignor to Zellweger AG, Uster, Switzerland

Filed Jan. 28, 1972, Ser. No. 221,705
Claims priority, application Switzerland, Mar. 22, 1971, 4240/71
Int. Cl. G01n *21/30*; G01j *3/34*; H04n *3/00*
U.S. Cl. 250—219 Q **5 Claims**



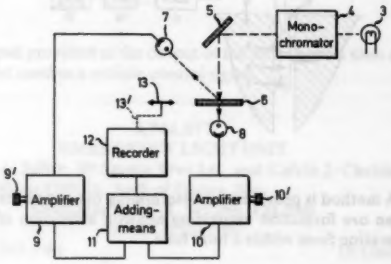
A correction apparatus for an optical reading mechanism wherein at least two line filters arranged in intersecting planes are disposed between a scanning track and a receiver.

3,746,869

METHOD OF PHOTOMETRICALLY PLOTTING LIGHT SCATTERING OBJECTS

Sven Lindstedt, Goteborg; Laszlo Treiber, Vastra Frolunda, both of Sweden; Peter Stollnberger, Munich, and Walter Tausch, Aalen, both of Germany, assignors to Carl Zeiss-Stiftung, Wuerttemberg, Germany

Filed Sept. 28, 1971, Ser. No. 184,416
Claims priority, application Germany, Sept. 30, 1970, P 20 47 952.1
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **18 Claims**



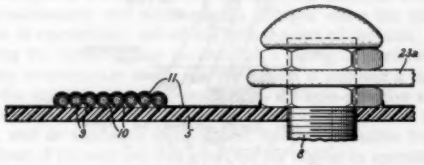
The invention contemplates an improved method and apparatus for photometrically plotting light scattered by a light-scattering object, as in the plotting of thin-layer chromatograms. Light is irradiated upon one surface of the object, and both the diffusely reflected light and the directly reflected light are simulatenously evaluated, in such manner (a) that base-line variations are minimized and (b) that light-scattering signal attributable to the observed substance is maximized and more readily identified.

3,746,870

COATED LIGHT CONDUIT

Donald M. Demarest, Wallingford, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 21, 1970, Ser. No. 99,892
Int. Cl. G01r *31/00*; G02b *5/14*
U.S. Cl. 250—227 **1 Claim**



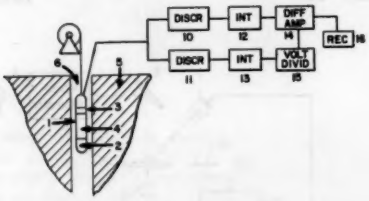
A coating having uniform resistive properties is applied to the surface of a light-transmitting fiber or conduit which is supported by the wall of an insulating enclosure between regions of substantially different potentials. The same coating also covers the exterior surface of the supporting wall. Electrical discharge along the conduit surface, resulting from the breaking down of surface resistivity between localized areas of differing potential, is prevented by the presence of the coating which provides a resistive surface while allowing charge mobility sufficient to neutralize adjacent areas of differing potential.

3,746,871

METHOD OF DETERMINING THE PRESENCE AND AMOUNT OF VANADIUM IN AN EARTH FORMATION

Henry H. Kramer, Mahwah, N.J.; C. Sheldon Thompson, Lewiston, N.Y., and Frank J. Cosolito, Ringwood, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,484
Int. Cl. G01t 1/20
U.S. Cl. 250—270 1 Claim



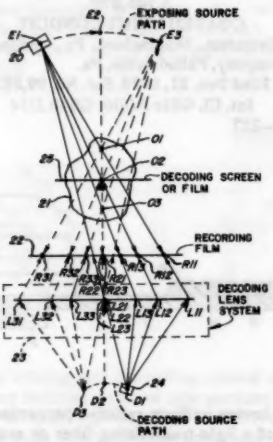
A method is provided for determining the vanadium content of an ore formation employing neutron activation of the ore formation from within a bore hole.

3,746,872

TOMOGRAPHY TECHNIQUE IN WHICH A SINGLE RECORDING FILM RETAINS SPATIAL INFORMATION TO PERMIT CONSTRUCTING ALL PLANAR SECTIONS OF OBJECT

John B. Ashe, and James D. Hall, both of Austin, Tex., assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed July 27, 1971, Ser. No. 166,510
Int. Cl. G01n 21/00, 23/00, 23/04
U.S. Cl. 250—313 10 Claims



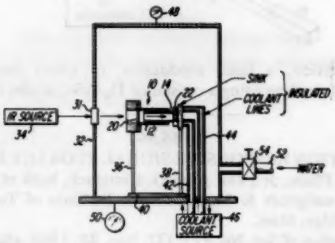
An x-ray holotomographic system in which a holotomographic shadow image is recorded on a stationary recording medium such as film as an object is exposed to rays from varying angles and the holotomographic shadow image is decoded using a decoding light source and decoding lens system to produce a reconstructed three dimensional image space representative of the original three dimensional object.

3,746,873

ANTI-CONDENSATION DEVICE FOR INFRA-RED DETECTOR

Richard Jean Williams, Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,328
Int. Cl. G01j 5/06
U.S. Cl. 250—352 9 Claims



An infra-red (IR) detector operating in ambient temperatures in the range of 4° to 200° Kelvin, and pressures in the range of 10^{-4} to 10^{-12} mm Hg is provided with a trap for preventing condensation and thus icing of water molecules in the infra-red (IR) optical path that may be present in or near the detector or icing of water molecules which may emerge from the surface of the components adjacent to the detector owing to the ambient low pressures. The detector is mounted within a two-piece cylindrical shield around the IR-path arranged in coaxial spaced relation. The clearance space between the shield pieces defined by the overlapping open ends of the cylinders is less than the mean free path of water molecules at the ambient pressure which is less than 10 microns for orbiting satellites. The outer shield is kept at a temperature that is greater than the vapor condensation or crystallization temperature while the inner shield, insulated from the outer shield, is kept at a temperature that is less than the vapor condensation or crystallization temperature. Water vapor or other vaporizable contaminants that would tend to leak into the portion of the inner shield adjacent to the detector surface are condensed or crystallized at the surface of the inlet portion of the space and thus precludes such vapors from being deposited on the operating portions of the detector disposed within the inner shield. Although water vapor is the more troublesome volatile vapor that is removed from the sensor chamber, oils, alcohols, and various synthetic polymers are also removed precluding contaminant deposition in the sensor chamber.

3,746,874

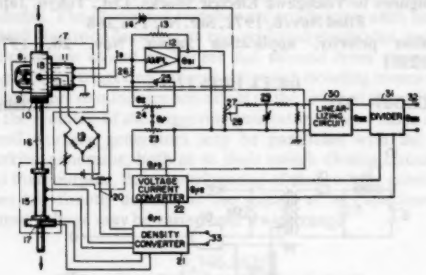
APPARATUS USING X-RAYS FOR MEASURING THE CONTENT OF AN ELEMENT HAVING A HIGHER MASS ABSORPTION COEFFICIENT THAN HYDROGEN AND CARBON IN HYDROCARBON COMPOUNDS

Shuichi Ohata, Tadashi Kamino, Isutomu Hirayama, Yoji Takeuchi, Kaisuke Muraki, Takeshi Ishiguro, and Hiroaki Kamano, all of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Oct. 6, 1970, Ser. No. 78,507
Claims priority, application Japan, Oct. 9, 1969, 44/80950; Oct. 8, 1969, 44/96100 (utility model); Oct. 9, 1969, 44/80954
Int. Cl. G01n 23/12
U.S. Cl. 250—358 15 Claims

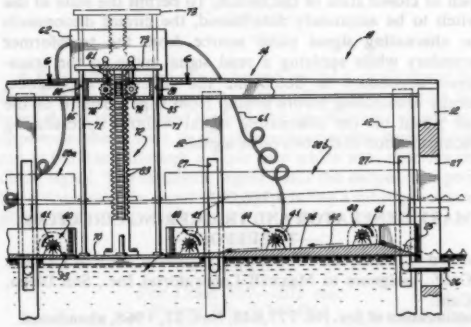
In an apparatus for measuring the concentration of elements such as sulphur, chlorine, nickel or lead contained in hydrocarbon compounds there is provided a source of

radioactive rays having an energy level of about 60 to 100 KeV, a target irradiated with the radioactive rays to emanate



fluorescent X-rays having an energy level of about 23 to 24.5 KeV, and means to detect the fluorescent X-rays which are transmitted through the petroleum.

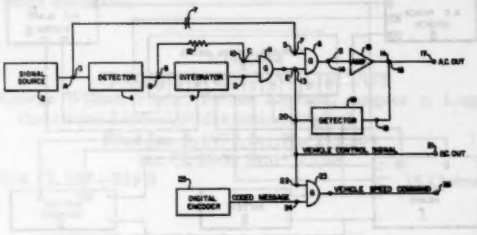
3,746,875
ELECTRICAL POWER PLANT DRIVEN BY OCEAN WAVES AND TIDES
Joseph Donatelli, 2624 Mozart St., Los Angeles, Calif.
Filed Aug. 4, 1972, Ser. No. 277,876
Int. Cl. F03b *13/12*
U.S. Cl. 290—42 **10 Claims**



A four-way power plant operable to generate electrical energy both from the up and down two-directional movement of the ocean surface and also from the two-directional flow of the ocean towards and away from a shore includes fixed structure mounted on the ocean floor and a floating platform slidably connected with the fixed structure. Electricity is generated from mechanism, preferably gears, driven by the up and down movement of the platform and from other mechanism, preferably paddle wheels, driven by the flow of water directed across the platform.

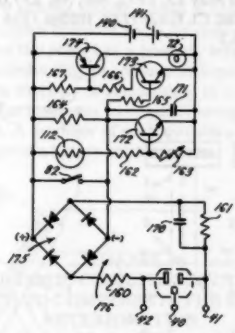
3,746,876
APPARATUS FOR PROVIDING A DELAYED VEHICLE CONTROL SIGNAL
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 18, 1972, Ser. No. 290,051
Int. Cl. B60g *1/00*
U.S. Cl. 307—10 R **7 Claims**

A periodic input signal is detected and then delayed for a predetermined amount of time. The delayed signal is then used to close a switch which then provides an enable signal for allowing a gate to pass the periodic input signal. The periodic



input signal provided at the output of the latter gate is then detected and used as a vehicle control signal.

3,746,877
EMERGENCY LIGHT UNIT
William A. Seiter, 80 Smoke Tree Ln., and Calvin J. Christensen, 6 Stone Cliff Ct., both of Fenton, Mo.
Filed Mar. 8, 1971, Ser. No. 121,990
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **18 Claims**

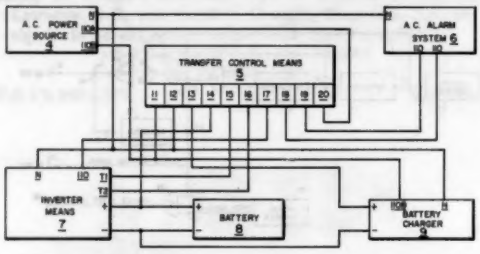


An emergency light unit of a size for mounting in a standard electrical wall box. The unit is preferably self contained and includes means for energizing the light when the main electrical power fails and the ambient light in the area in which it is mounted is below a prescribed level. The light is powered during emergency conditions from rechargeable batteries which are continuously and automatically charged when the main power is operational. All of the components of the unit, including the batteries, are mounted in a casing of preferably unitary construction at the front of which is exposed a light bulb for supplying the emergency light, the light-sensitive surface of a photocell for sensing the ambient light level in the area, and an electrical utility outlet. Means accessible from the front of the unit are also provided for testing its operability.

3,746,878
STANDBY POWER SOURCE FOR AN AC ALARM SYSTEM
George P. Viger, Jr., Commack, N.Y., assignor to Signal Communications, Inc., East Northport, N.Y.
Filed Mar. 15, 1972, Ser. No. 234,906
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **2 Claims**

A standby power source connected to AC power mains for supplying AC power to an AC alarm system when there is a main power failure comprises a source of DC power, inverter

means for converting DC power to AC power and controlled switching means for connecting the source of DC power to the



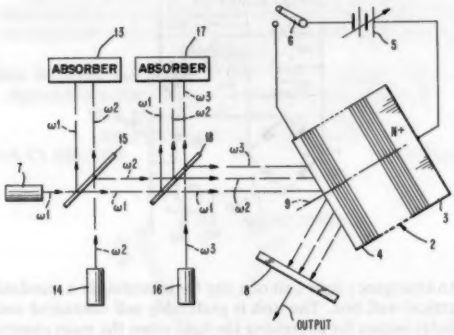
inverter means and for transferring the connection of the AC alarm system from the AC power mains to the inverter means at the time of a power failure.

3,746,879

SUPERLATTICE HARMONIC GENERATOR & MIXER FOR ELECTROMAGNETIC WAVES

Leo Esaki, Chappaqua, and Raphael Tsu, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1972, Ser. No. 257,044
Int. Cl. G02f *1/28*; H02m *5/06*
U.S. Cl. 307—88.3 **18 Claims**



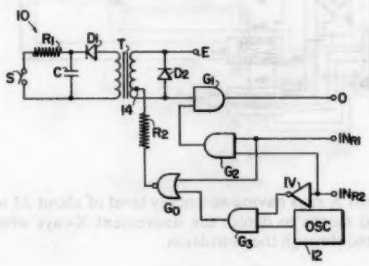
The disclosure relates to a device for generating electromagnetic waves which have wavelengths different from an input wavelength to the device. The device consists of man-made superlattice structure fabricated by epitaxial deposition techniques to which at least one electromagnetic wave is applied. The input wave has an electric field component parallel to the longitudinal axis of the superlattice structure. Because of the special characteristic of the superlattice structure, it is possible to obtain as outputs all the odd harmonics of the input wavelength. By applying an electric field parallel to the longitudinal axis of the superlattice, it is possible to obtain both odd and even harmonics of the input wavelength. By switching the electric field, a gating action is obtained. To select the desired harmonic, appropriate filters are used. Mixing as well as harmonic generation is possible with the arrangements disclosed by applying a plurality of input wavelengths which by multiple photon processes produce outputs having relatively long wavelengths compared to the input wavelength. The mixed outputs in both the presence and absence of an applied electric field are obtainable by filtering. Thus, inputs in the visible range may be mixed to provide outputs in the far infrared region which are not easily obtainable using prior art arrangements.

3,746,880

CIRCUIT FOR DETERMINING THE STATE OF A DC ISOLATED SWITCH

Tadamitsu Iritani, and Yoshikazu Kumagai, Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Nov. 8, 1971, Ser. No. 196,268
Claims priority, application Japan, Nov. 20, 1970, 45/102501
Int. Cl. H01h *31/34*
U.S. Cl. 307—97 **9 Claims**



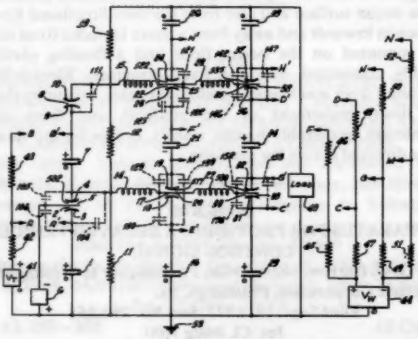
A switch and a device for monitoring the open or closed state of the switch are conneted by a DC isolation circuit including an isolating transformer, a capacitor in the transformer primary circuit with the switch connected across the capacitor, and, in the transformer secondary circuit, an alternating pulse signal source to charge the capacitor through the transformer. In this circuit, the impedance reflected into the transformer secondary winding varies in accordance with the open or closed state of the switch. To permit the state of the switch to be accurately determined, the circuit disconnects the alternating signal pulse source from the transformer secondary while applying a read signal pulse to the transformer secondary to determine the reflected impedance, thereby eliminating errors arising from superposition of the read signal on the alternating signal without necessitating synchronization of the two pulse signals.

3,746,881

MARX GENERATOR AND TRIGGERING CIRCUITRY THEREFOR

Richard A. Fitch, and Walter F. J. Crewson, both of LaJolla, Calif., assignors to Maxwell Laboratories Inc., San Diego, Calif.

Continuation of Ser. No. 777,848, Nov. 21, 1968, abandoned.
This application Feb. 16, 1971, Ser. No. 115,801
Int. Cl. H02m *3/18*, *3/12*
U.S. Cl. 307—110 **4 Claims**



A compact working Marx generator consisting of a stacked plurality of chargeable capacitors and normally open switches

between successive capacitors, and a second Marx generator, having a rapid self-erection rate, for triggering the closing of at least some of the switches at a rate substantially faster than the compact generator self-erection rate, necessarily slow because of its large interstage stray capacitance resulting from its compactness. The illustrated switches are spark gaps, each having a third electrode between its two principal electrodes, and the switches are closed by pulses fed thereto from successive stages of the triggering generator through isolating means such as inductors to minimize any effect of the firing of the switches on the erection of the triggering generator. One or more additional working generators may be paralleled with the first working generator, both as to their switch closing circuitries and their outputs. Because triggering of the working generator does not directly depend on the voltage of its capacitors, its output voltage may be varied over a wide range.

3,746,882

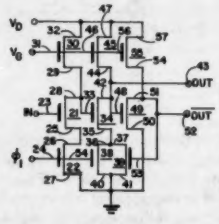
INPUT SYNCHRONIZER CIRCUIT

Gary L. Heimbigner, Anaheim, Calif., assignor to North American Rockwell Corporation, El Segando, Calif.

Division of Ser. No. 884,525, Dec. 12, 1969, abandoned. This application July 2, 1971, Ser. No. 159,556

Int. Cl. H03k *19/08*

U.S. Cl. 307—205 **3 Claims**



A field effect transistor is turned on by a clock signal for sampling an input signal. A voltage level representing the input signal is processed through the synchronizer circuit and appears at the output. A signal representing the inverted output is fed back through a logic gate which also receives the clock signal. The feedback signal holds the output in a good logic state until the input is changed during a subsequent sampling time.

ERRATUM

For Class 307—205 see:
Patent No. 3,747,064

3,746,883

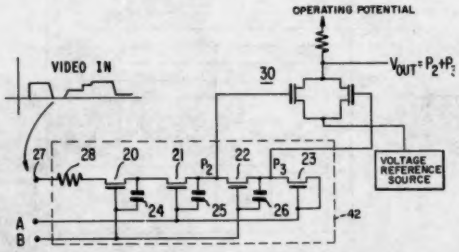
CHARGE TRANSFER CIRCUITS

Michael George Kovac, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 4, 1971, Ser. No. 186,078

Int. Cl. G11c *11/40*

U.S. Cl. 307—221 D **4 Claims**



A video processing circuit operates on a serrated video signal to provide a serration-free output video signal. A configuration employs a summing circuit coupled to a charge transfer circuit which transfer circuit propagates a charge according to the timing of applied clock signals. The summing circuit provides a video signal relatively free of interfering clock transitions.

3,746,884

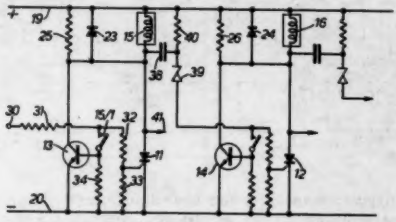
FREQUENCY HALVING CIRCUITS

George William Foster, Bolton, England, assignor to Legg (Industries) Limited, Staffordshire, England

Filed Jan. 5, 1972, Ser. No. 215,569

Int. Cl. H03k *23/03, 23/08*

U.S. Cl. 307—225 B **19 Claims**



In a frequency halving circuit a relay is connected across a supply in series with a thyristor and a transistor in parallel with one another, and the relay has a contact, arranged, when the thyristor is not conducting, to connect an input pulse to trigger it, and, when the thyristor is conducting, to connect the input pulse to cause the transistor to conduct momentarily and cut off the thyristor. A member of such circuits can be combined to form the stages of a binary counter.

3,746,885

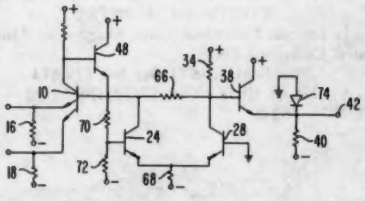
IMPROVED LOGIC CIRCUIT USING A CURRENT SWITCH TO COMPENSATE FOR SIGNAL DETERIORATION

Herbert Stopper, Orchard Lake, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed July 6, 1971, Ser. No. 159,990

Int. Cl. H03k *19/24, 19/30, 5/08*

U.S. Cl. 307—218 **8 Claims**

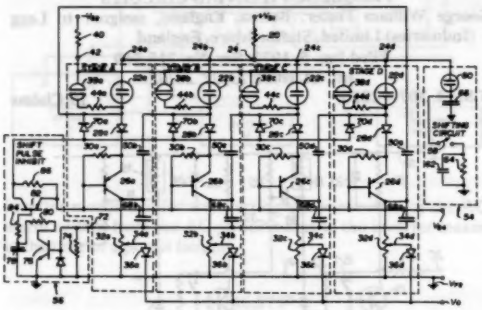


An improved logic circuit comprising an input semiconductor, an output semiconductor and a current switch connected therebetween to compensate for signal deterioration in the logic circuit. The input semiconductor is biased to remain unsaturated in response to a binary signal swing at an input terminal. In an AND gate, the input semiconductor is a multiemitter transistor; in an OR gate, the input semiconductor is a plurality of transistors.

3,746,886
MEMORY CIRCUIT

John G. Konopka, Mundelein, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Oct. 15, 1971, Ser. No. 189,637
Int. Cl. H03k 23/02, 23/18
U.S. Cl. 307—223 24 Claims

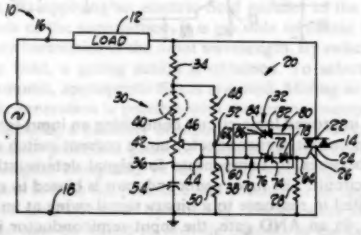


A triggered neon lamp memory circuit selectively produces control voltages for an electrically controlled rado wave receiver. Each stage comprises a neon lamp, a transistor and a control voltage potentiometer coupled in series between a common source of sustaining potential and a point of reference potential. When the neon lamp of a given stage is triggered, the associated transistor is turned on to effectively couple a fixed voltage to the control voltage potentiometer. When the neon lamp turns off, the transistor turns off to remove the fixed voltage from the control voltage potentiometer while, at the same time, enabling the voltage at one terminal of the neon lamp to remain substantially above the reference potential to thereby reduce the voltage across the neon lamp to a point substantially below the trigger level. In one embodiment, the neon lamp of any one stage is triggered on by temporarily coupling a trigger potential to the neon lamp by manually actuating a touch contact. The triggering of any one lamp lowers the common sustaining potential to thereby extinguish the neon lamp of the previously activated stage. In another embodiment, a shifting circuit, either remotely or locally activated, successively triggers each lamp so that the circuit functions in the nature of a ring counter. In the remote control embodiment, programming means are provided to cause the shifting circuit to selectively prefer preselected ones of the plurality of stages by providing a greater selection period therefor.

3,746,887
CONDITION RESPONSIVE A. C. PHASE ANGLE CONTROL CIRCUITRY

Jerome L. Lorenz, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Sept. 9, 1971, Ser. No. 179,071
Int. Cl. H03k 17/66, 17/72; G05f 1/40
U.S. Cl. 307—252 B 8 Claims

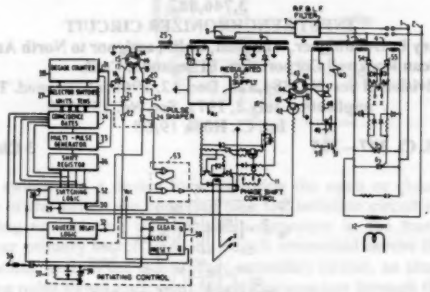


A condition responsive A.C. phase angle control circuit is disclosed which comprises a gated control switch for a load and condition responsive circuitry governing operation of the control switch. The condition responsive control circuit comprises an A.C. condition sensing bridge and a triggerable device which provides positive going and negative going gating pulses to the control switch in response to bridge output signals. The triggerable device can be formed by an integrated circuit defining a programmable unijunction transistor circuit and an SCR circuit.

3,746,888
MAGNETIC FIRING CIRCUITS

Fitzwilliam Allan Wentworth, Mosman, New South Wales, Australia, assignor to Cutler-Hammer Inc., Milwaukee, Wis.

Filed Sept. 23, 1971, Ser. No. 182,963
Int. Cl. H03k 3/45
U.S. Cl. 307—282 3 Claims

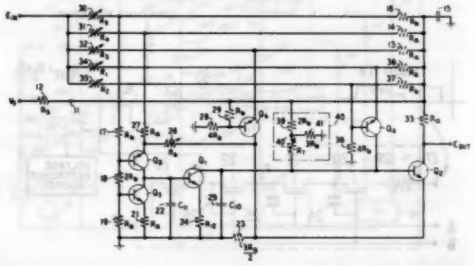


A fully solid state electrical welding control system employs a magnetic firing circuit for producing pulses for controlling, for example, the solenoid air valve. The magnetic core of the firing circuit has a rectangular hysteresis loop, and a primary winding on the core is connected to the A.C. source. Current is produced through a control winding to hold the core in a state of saturation in one direction when a control voltage is absent, and a current is produced in the opposite direction through that winding to hold the core in a state of saturation in the opposite direction when the control voltage is present. Pulses are taken from an output winding on the core, and are produced synchronously with the mains supply with a high degree of electrical isolation and a high degree of decoupling between the control circuit and the alternating current and pulse circuits.

3,746,889
TRANSMISSION NETWORK EXHIBITING BIQUADRATIC TRANSFER RESPONSE

Richard James Cubbison, Jr., Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 6, 1972, Ser. No. 215,861
Int. Cl. H03h 7/10
U.S. Cl. 307—295 16 Claims



A multitransistor circuit equivalent to a modified gyrator network configuration is used to obtain a general biquadratic

transfer response. First and second predetermined currents are supplied to the ports of the gyrator and third and fourth currents proportional, respectively, to an applied input signal and to the voltage developed at one of the gyrator ports are supplied to an output resistor in order to obtain a desired output voltage.

3,746,890

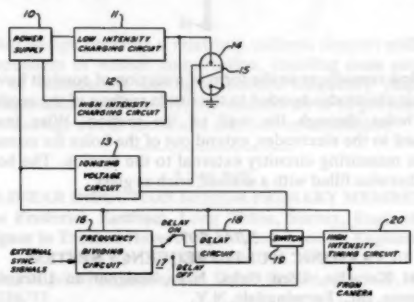
STROBOSCOPE CONTROL SYSTEM

Gerald E. Walker, Kimberton, Pa., assignor to Automation Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 607,178, Jan. 4, 1967, Pat. No. 3,576,468. This application July 6, 1970, Ser. No. 60,986

Int. Cl. H03k *5/13*

U.S. Cl. 307—293 **7 Claims**



A system for triggering a strobe lamp at a low light intensity in response to signals which are automatically derived by frequency-division from much higher frequency synchronizing signals. It also includes a circuit which enables the production of a single, very high intensity strobe flash by one of the synchronizing signals in response to activation of associated photographic apparatus.

3,746,891

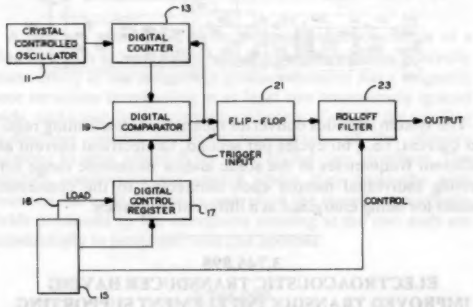
DIGITALLY CONTROLLED SINE WAVE GENERATOR

John J. Rowe, Bowie, Md., assignor to The Singer Company, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 211,977

Int. Cl. H03k *1/16*

U.S. Cl. 307—271 **8 Claims**



Shown is a sine wave generator provide a highly stable output frequency which may be selected by an input signal from a digital computer. A crystal controlled oscillator provides its output to a digital counter, the output of which is compared with a register loaded by the computer. Each time the count equals the loaded value a flipflop is triggered and the counter reset causing the flipflop to provide a square wave output of a predetermined frequency. The square wave is then filtered by a digitally controlled filter to provide a final output which is a sine wave of the desired frequency.

3,746,892

OUTPUT VOLTAGE REGULATION SYSTEM

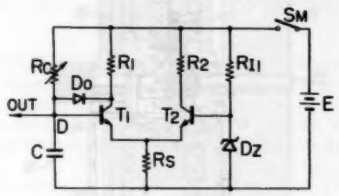
Mitsutoshi Ogiso, 673 Ichinotsubo, and Tetsuya Taguchi, 3-555-Kizuki, both of Kawasaki-shi, Kanagawa-ken, Japan

Filed Apr. 19, 1971, Ser. No. 134,971

Claims priority, application Japan, Apr. 24, 1970, 45/35186

Int. Cl. H03k *17/00*

U.S. Cl. 307—297 **5 Claims**



A time constant circuit comprising a variable resistor and a capacitor has a differencial amplifier connected thereto. Between the time constant circuit and the differential amplifier, an unidirectional feedback path is connected to provide the regulated output voltage.

3,746,893

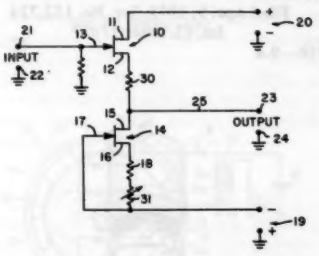
FIELD EFFECT TRANSISTOR IMPEDANCE COUPLING NETWORK WHOSE OUTPUT VOLTAGE EQUALS THE INPUT VOLTAGE

Yves De Bretagne, Minneapolis, Minn., assignor to Honeywell Inc., Minnepolis, Minn.

Continuation of Ser. No. 807,687, March 17, 1969, abandoned. This application July 29, 1971, Ser. No. 167,520

Int. Cl. H03f *3/04*

U.S. Cl. 307—304 **1 Claim**



A field effect transistor impedance coupling circuit having two series connected field effect transistors. The source of the first transistor is connected to the drain of the second transistor through a resistor. The gate of the first transistor is the input. The drain of the second transistor is the output. The second transistor is connected as a constant current source, and the resistance value of the resistor is selected so that the output voltage equals the input voltage.

3,746,894

DYNAMOELECTRIC MACHINE VIBRATION ISOLATION MOUNTING ARRANGEMENT

Richard W. Dochterman, and David H. Yeaman, Jr., both of Fort Wayne, Ind., assignors to General Electric Company, Ft. Wayne, Ind.

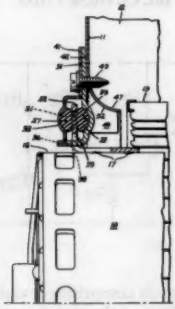
Filed Aug. 4, 1971, Ser. No. 168,960

Int. Cl. H02k *5/24*

U.S. Cl. 310—51 **5 Claims**

Electric motor supported on a blower housing so as to withstand shipping shock and other impact loads, so as to isolate torque pulsation vibrations from the blower. Motor

mounting arrangement may include rigid members secured to the motor, resilient vibration isolator supported by a rigid member, and a pair of interlocking clamping arms for compressing the vibration isolator. At least one clamping arm may be braced by the housing so as to enhance the strength or rigidity of the arrangement.



3,746,895

PIEZOELECTRIC TRANSDUCER ASSEMBLY AND STRUCTURE FOR MOUNTING PIEZOELECTRIC ELEMENT THEREIN

Ralph W. Goble, Boulder, Colo., assignor to Sontrix, Inc., Boulder, Colo.

Filed Apr. 9, 1971, Ser. No. 132,724
Int. Cl. H04r *17/00*
U.S. Cl. 310—9.4 **13 Claims**

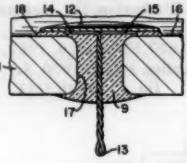
A transducer assembly has a twister flexing type piezoelectric element mounted therein by structure including a pair of wirelike members positioned to extend perpendicularly to each other to clamp the element therebetween by contacting it only at selected peripheral edge points. The assembly includes a phase shifting flow restriction which eliminates destructive interference at the element's surfaces. The wirelike members are electrically conductive so as to also function as electrodes and the electrodes of the element are connected to a pair of electrical terminals included in the assembly.

3,746,896

ELECTROMAGNETIC FLOW TRANSDUCERS HAVING LAMINAR ELECTRODES

Heinz Walter Gruner, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed June 12, 1972, Ser. No. 262,111
Int. Cl. G01p *5/08*; H02n *4/00*
U.S. Cl. 310—11 **6 Claims**



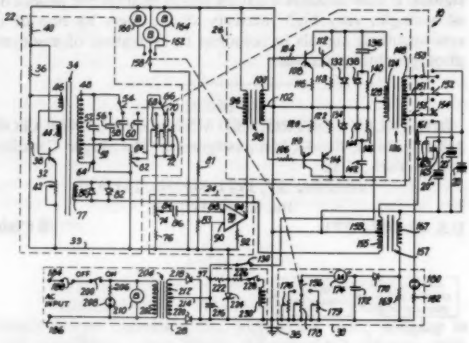
A flow transducer in the form of a section of conduit having laminar electrodes bonded to the inside surface of the section, over holes through the wall of the section. Wire leads, fastened to the electrodes, extend out of the holes for connection to measuring circuitry external to the section. The holes are otherwise filled with a sealant, such as glass.

3,746,897

ULTRASONIC MULTI-FREQUENCY SYSTEM

Manuel Karatjas, Glen Oaks, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Filed July 28, 1971, Ser. No. 166,862
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **10 Claims**



The system includes converter means for transforming regular current; i.e., 60 cycles per second, to electrical current at different frequencies in the sonic and/or ultrasonic range for driving individual motors each connected to the converter means for being energized at a different frequency.

3,746,898

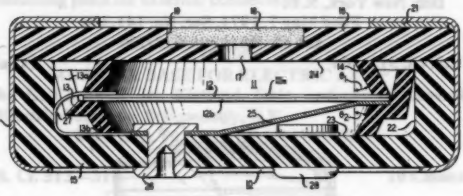
ELECTROACOUSTIC TRANSDUCER HAVING IMPROVED TRANSDUCING ELEMENT SUPPORTING MEANS

Thomas Charles Austin, Eatontown, and Herbert William Bryant, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1971, Ser. No. 190,209
Int. Cl. H04r *17/00*
U.S. Cl. 310—9.4 **11 Claims**

A planar transducing element is supported within a transducer housing by a pair of specially dimensioned generally conical rubber washers. The first washer includes a first portion comprising a hollow frustum of a cone for spacing the ele-

ment from the side walls of the housing, and a second generally conical portion integral with the first portion for seating the element and spacing it from the housing bottom. The second washer also includes a hollow frustum of a cone for spacing the element from the top of the housing. The



washer design provides a relatively uniform support stiffness, independent of washer compression, enabling mass production of transducers having a desired frequency response characteristic. Additionally, the washers serve to prevent element damage due to shock and moisture condensation.

3,746,899

LINEAR INDUCTION MOTOR PRIMARY MEMBER

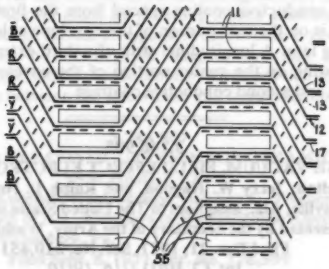
John Frederick Eastham, Long Ditton, Surrey, England, assignor to Tracked Hovercraft Limited, London, England

Filed Apr. 19, 1972, Ser. No. 245,517

Claims priority, application Great Britain, Apr. 29, 1971, 12,226/71

Int. Cl. H02k *41/04*

U.S. Cl. 310—12 **12 Claims**



A primary member in or for a linear induction motor of a kind in which at least part of the working flux passes generally transversely of the motor; the primary member has a magnetic core structure terminating in at least two transversely spaced ends, and a two-layer energising winding of which the winding conductors extend generally transversely of the primary member to pass adjacent the ends of the core structure. The winding conductors are angled where they cross the gaps between the ends so that in operation the travelling magnetic fields produced by the energising winding at the two ends are substantially in antiphase with one another.

3,746,900

SYNCHRONOUS MOTOR WITH IMPROVED STARTING CHARACTERISTICS

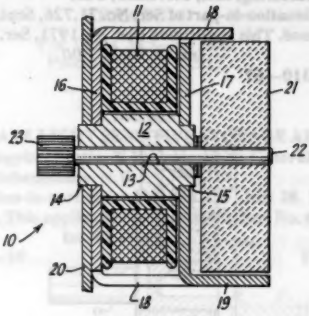
Edwin R. Morley, Two Rivers, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 1, 1972, Ser. No. 230,616

Int. Cl. H02k *7/10*

U.S. Cl. 310—41 **8 Claims**

A synchronous A.C. motor having two sets of stator poles disposed in circular spaced alternate series, a rotor disposed therein with alternate pole areas equal in number to the stator poles which provide two paths for rotor flux when the motor is quiescent, and the stator poles being made such that the normally lesser dominent flux path is dominent causing the rotor



to assume a desired starting position while not causing imbalance when the motor is operated.

3,746,901

MAGNETO GENERATOR FOR IGNITION SYSTEMS OF INTERNAL COMBUSTION ENGINES

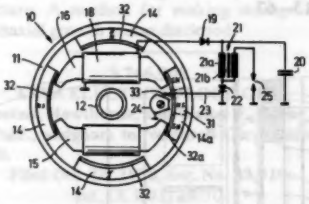
Georg Haubner, Berg, and Walter Hofer, Schwabach, both of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Dec. 14, 1972, Ser. No. 314,913

Claims priority, application Germany, Feb. 18, 1972, P 22 07 639.7

Int. Cl. F02p *1/00*

U.S. Cl. 310—70 **12 Claims**



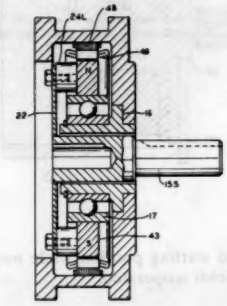
To provide triggering pulses to trigger a solid-state control ignition system from the same magnetic circuit which also provides power for the ignition spark itself, a control magnet is located within the physical outline of the main magnet which cooperates with the power winding to provide energy for the spark, the control magnet being reversely polarized with respect to the main magnet and having a circumferential extent which is dimensioned with respect to pole shoes of a pulse generator winding, located in magnetic circuit to the control magnet and the main magnet so that, at least once during each revolution of the magneto rotor, the pole shoes of the pulse generator winding are simultaneously located opposite the main magnet and the reversely polarized auxiliary or control magnet. Preferably, the control magnet is located internally of a cup-shaped rotor, and the armature windings are located within the rotor and stationary, on a plate, the control winding being fitted between the pole shoes of the armature and having limited circumferential extent.

3,746,902

ROTOR AND STATOR MOUNTING FOR DYNAMIC MACHINES

Robert J. Hetzel, Maple Heights, Ohio, assignor to Avtron Manufacturing, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 71,726, Sept. 14, 1970, abandoned. This application Dec. 30, 1971, Ser. No. 214,487
Int. Cl. H02k 7/00
U.S. Cl. 310—67 2 Claims



For cooperation with stator and rotor of a main drive unit and for control or measurement system having an analog voltage generator, a digital pulse generator is flat shaped and has a stator which is secured to be supported by the main drive stator while the pulse generator has a shaft coupled to be driven by the main drive unit rotor.

3,746,903

PHOTO-MULTIPLIER STRUCTURE

Johann Battesta Beeli, Sylmar; Roger Henry Brown, Burbank, and Philip George Reif, Chatsworth, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,523
Int. Cl. H01j 31/36, 43/24
U.S. Cl. 313—67 3 Claims

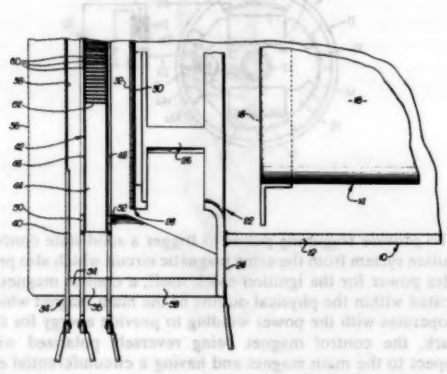


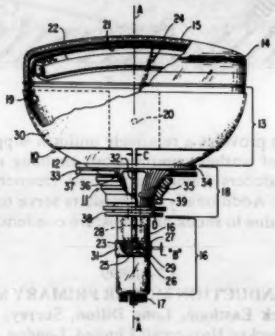
Photo multiplier structure for a television camera-type storage vacuum tube, wherein a channel-type electron multiplier is employed which is sensitized principally only in a central area thereof which corresponds to the scanning area of the electron beam of an electron gun forming a part of the storage tube. This results in a substantial reduction of tube noise, eliminating overdriving of the preamplifier, and thereby providing increased sensitivity and resolution of the entire system.

3,746,904

CATHODE-RAY TUBE INCLUDING A GLASS ENVELOPE WITH TWO SPACED EXTERNAL CONDUCTIVE COATING AND A CONNECTING STRIP OF A THIRD EXTERNAL CONDUCTIVE COATING THEREON

Alton John Torre, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1971, Ser. No. 141,300
Int. Cl. H01j 29/00, 31/00
U.S. Cl. 313—64 1 Claim



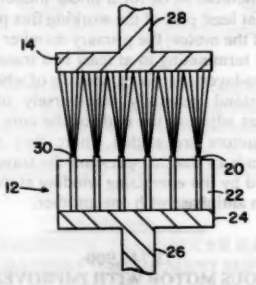
A cathode-ray tube including a glass envelope having a forward portion terminating in a viewing screen, a center portion, and a rear portion including an electron-gun assembly having at least one focusing lens therein. A first external conductive coating is on the forward portion of the envelope, and a second conductive coating spaced from the first conductive coating is on the rear portion of the envelope at least over the focusing lens. A longitudinal strip of a third external conductive coating on the center portion of the envelope connects the first and second conductive coatings.

3,746,905

HIGH VACUUM, FIELD EFFECT ELECTRON TUBE

Joe Shelton; Jerry W. Hagood, and Ralph L. Norman, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 21, 1971, Ser. No. 210,451
Int. Cl. H01j 1/16, 19/10
U.S. Cl. 313—309 3 Claims



An improved electron tube is provided which eliminates the need for a heated electron source and affords simplified construction. The tube, a high vacuum tube, is capable of operating over an extended range of electrical potentials. The electron tube operates on the principle of electric field effect emission for the electron source, requiring neither gas, vapor nor a heated electrode in its envelope. Two active elements, an emitter and a collector, are enclosed in an evacuated chamber with outside connections to each element. The col-

lector is a metal plate and the emitter is an oxide-metal composite which contains a very large number of metal filaments embedded in an insulating oxide matrix. The number of filaments normally exceed one million per square centimeter of exposed surface, having ends connected on the back side to a conducting plate for external connection.

3,746,906

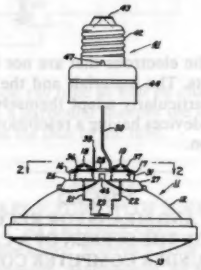
ADAPTER BASE FOR ELECTRIC LAMP

John G. Cardwell, Jr., Kirtland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1971, Ser. No. 170,589

Int. Cl. H01j 5/48

U.S. Cl. 313—318 **10 Claims**



An adapter screw-base is attached to a lamp of the type having cup-shaped ferrule terminals, by means of an adapter disc positioned over the ferrule terminals and against the lamp envelope and held in place by fastening means attached to the outer ends of the ferrule terminals. A screw-base is positioned with its skirt surrounding the adapter disc and attached thereto by interlocking indentations. Wires provide electrical connections between the screw-base and ferrule terminals.

3,746,907

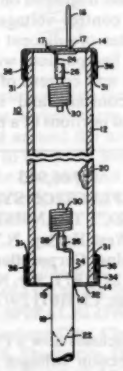
END CAP CONFIGURATION FOR CERAMIC DISCHARGE LAMP

William J. Knochel, West Orange, and Leo C. Werner, Cedar Grove, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 8, 1971, Ser. No. 178,599

Int. Cl. H01j 5/52

U.S. Cl. 313—318 **6 Claims**



In a ceramic discharge lamp including an elongated tubular ceramic body closed off at each end by electrode carrying refractory metal end caps sealed thereto, the improvement comprising a plurality of inwardly directed indentations circumferentially disposed about the skirt portion of the end cap, said indentations being constructed and arranged to lightly grip the outer surface of the tubular ceramic body and thereby facilitate a superior seal between the end cap and the tubular ceramic body.

ERRATUM

For Class 313—65 see:
Patent No. 3,746,917

3,746,908

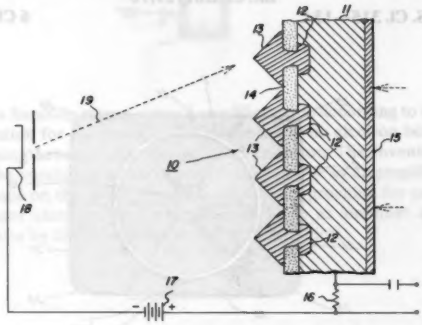
SOLID STATE LIGHT SENSITIVE STORAGE ARRAY

William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 845,435, July 28, 1969, abandoned. This application Aug. 3, 1970, Ser. No. 60,767

Int. Cl. H01j 31/26

U.S. Cl. 315—10 **17 Claims**



An improved electron beam information storage device is disclosed as comprising a target structure having an array of closely spaced diodes with electrically conducting self-registered projections in contact with the diodes and extending away from the surface of the diode array for intercepting the electron beam and conducting electrons to the diodes thereby preventing an undesirable charge buildup on the surface of target structure. A method for making storage devices by selective epitaxial growth is also disclosed.

3,746,909

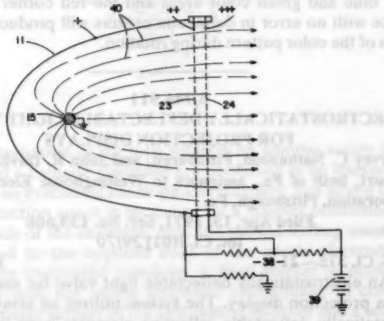
AREA ELECTRON FLOOD GUN

Royal K. Runtzel, Hawthorne, and Walter F. Goede, Torrance, both of Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

Filed Oct. 26, 1970, Ser. No. 83,910

Int. Cl. H01j 29/50

U.S. Cl. 315—13 R **5 Claims**



A strip filament provides a source of electrons. A deflector electrode, which may be in the general form of a parabolic

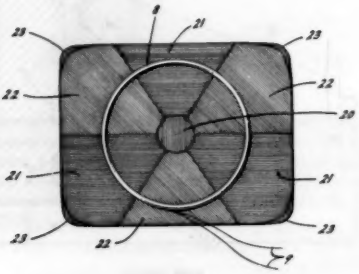
dish, is placed behind the filament and a screen electrode placed forward of the filament, i.e., in the direction in which electron flow is desired. The electrodes are positioned relative to the filament and have potentials applied thereto such that the electrons emitted from the filament are evenly distributed over a predetermined area throughout which electron flow is desired.

3,746,910

COLOR CATHODE RAY TUBE DEFLECTION YOKE EVALUATION

Leon J. Aber, Lafayette Hill, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Apr. 17, 1972, Ser. No. 244,724
Int. Cl. H01j 29/70
U.S. Cl. 315—13 C **6 Claims**



A method for evaluating the deflection center error between horizontal and vertical deflection coils in a deflection yoke for use with a shadowmask color cathode ray tube. The yoke to be evaluated is supplied with the usual vertical and horizontal deflection currents, and is placed in position on an operating cathode ray tube. The blue and green guns of this tube are turned off to establish a red raster, and an axial magnetic field is applied to the tube at the faceplate. Field intensity is adjusted to produce a color pattern having a red bullseye surrounded by alternating areas or sectors of blue and green, with small red color areas in the corners of the screen. The purity magnets are adjusted to center the bullseye. While maintaining a constant axial location, the yoke is rotated by at least a quarter turn. As the yoke is rotated any video patterns present will appear to rotate but the color pattern will remain essentially fixed. Any error in deflection centers between the horizontal and vertical coils will be manifested by motion in the blue and green color areas and the red corner spots. A yoke with no error in deflection centers will produce no motion of the color pattern during rotation.

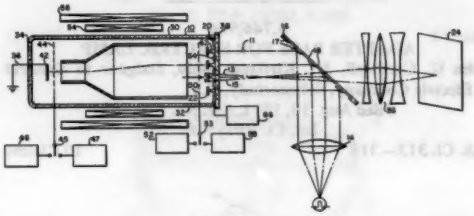
3,746,911

ELECTROSTATICALLY DEFLECTABLE LIGHT VALVES FOR PROJECTION DISPLAYS

Harvey C. Nathanson, Pittsburgh, and John R. Davis, Jr., Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 13, 1971, Ser. No. 133,608
Int. Cl. H01j 29/70
U.S. Cl. 315—21 R **15 Claims**

An electrostatically deflectable light valve for use in large area projection display. The system utilizes an array of electrostatically deflectable reflective elements lying in a plane which provides modulation of a light source directed thereon so as to spatially modulate and produce a display of brightness analogous to the amplitude of the deformation of the reflective elements. The elements of the array are comprised of a centrally located post supporting the reflective element. A common ground plane electrode is provided beneath the reflective elements and is capacitively associated therewith. This ground plane electrode in the cathode ray tube embodiment intercepts the electrons that are not intercepted by the reflective elements. The materials and the processes used in the fabrication particularly adapt themselves to the fabrication of large area devices having a resolution capability similar to that of television.

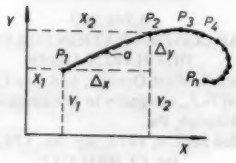


3,746,912

METHOD OF AND MEANS FOR RECORDING LINE DRAWINGS ON THE SCREEN OF A CATHODE RAY TUBE UNDER COMPUTER CONTROL

Friedrich Redecker, Kiel, and Ruediger Sommer, Raisdorf, both of Germany, assignors to Dr.-Ing. Rudolf Hell, Kiel, Germany

Filed July 15, 1970, Ser. No. 54,938
Claims priority, application Germany, July 16, 1969, P 19 36 051.1
Int. Cl. H01j 29/72
U.S. Cl. 315—26 **6 Claims**



Curves are plotted and displayed on the screen of a cathode ray tube by deriving control voltages from the differences between the coordinates of adjacent points of a curve, controlling the plotting of line portions with the derived voltages, maintaining the speed and current of the recording electron beam of the CRT constant and maintaining a uniform brightness of the several portions of a trace.

3,746,913

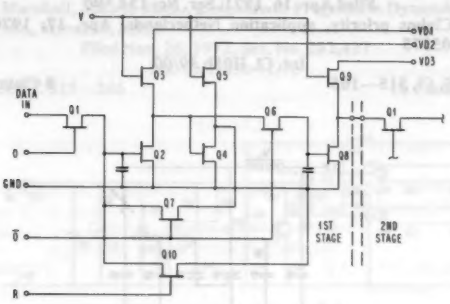
CATHODE RAY DEFLECTION SYSTEM USING FIELD EFFECT TRANSISTORS

William Gianopulos, West Hurley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1971, Ser. No. 211,024
Int. Cl. H01j 29/76
U.S. Cl. 315—27 TD **5 Claims**

This specification discloses how a FET shift register can be used to generate deflection voltages for cathode ray tubes. Each stage of the shift register contains two cross-connected FET's, each with a FET load device coupling it to a source of power, When a binary "1" is stored in a particular stage current is drawn through one of these FET load devices and when a binary "0" is stored in this stage current is drawn through the other of the FET load devices. The two FET load devices are separately connected to one of the two load devices in

each of the other stages of the shift register so that you have two summing circuits whose outputs vary with the data stored in the shift register. These outputs are connected to the deflection coil of a cathode ray tube so that by changing the data in the shift register in a particular manner the cathode ray beam can be made to scan the face of the tube.

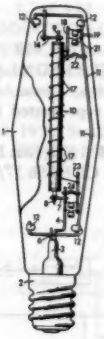


3,746,914

ARC DISCHARGE TUBE WITH SURROUNDING STARTING COIL

Albert W. Olson, Rockport; Warren Calvin Gungle, Danvers, and John F. Waymouth, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 30, 1971, Ser. No. 214,000
Int. Cl. H01j *7/24*
U.S. Cl. 315—47 **18 Claims**



A high pressure mercury-sodium lamp with an outer jacket and inner arc tube has several turns of tungsten resistance heating filament coiled around the arc tube. The filament is electrically connected to the leads which supply the arc tube electrodes and heats the mercury and sodium fill to arc striking temperature. At this temperature a bimetallic switch opens the filament connection.

3,746,915

TRAVELING WAVE TUBE WITH PLANAR EQUIANGULAR SPIRAL SLOW WAVE CIRCUIT

Louis J. Jasper, Jr., Neptune City; Charles M. DeSantis, Neptune, and Frederick B. Sherburne, Oceanport, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 15, 1972, Ser. No. 253,043
Int. Cl. H01j *25/34*
U.S. Cl. 315—39.3 **4 Claims**

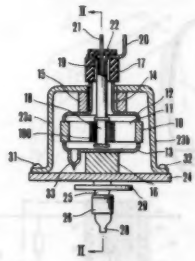
This invention concerns a more compact, lower-cost, lower-voltage, broader-band, traveling wave amplifier that has a cylindrical electron gun between closely spaced, parallel, flat surfaces of a pair of ceramic disks and a ring collector joined to the disks concentric with the electron gun. At least one of the flat surfaces has a printed slow wave circuit in the form of at least one tightly wound equiangular spiral arm between the electron gun and the collector. Though a high power amplifier needs focusing means, a small amplifier made according to the invention for operation at low power needs no electron beam focusing between electron gun and collector. The invention can be combined with a phased array to serve as an amplifier in place on the array; one such amplifier is provided for each radiator element. The invention can serve as amplifier and radiator by designing the spiral arm for radiation.

3,746,916

MAGNETRONS

Tomokatsu Oguro, Mobura City, Japan, assignor to Hitachi Ltd., Tokyo, Japan

Filed Apr. 26, 1972, Ser. No. 247,821
Claims priority, application Japan, Apr. 26, 1971, 46/26780
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.51 **8 Claims**



In a magnetron of the type wherein an annular anode electrode and a cathode electrode are contained in an interaction space in an evacuated envelope and magnetic flux acting upon the interaction space is produced by a magnet positioned on the outside of the envelope, first and second sealing members are sealed to the opposite ends of the anode electrode to define the evacuated envelope, a first magnet is disposed coaxially with the anode electrode substantially in contact with the outer surface of the first sealing member and a second magnet is disposed coaxially with the anode electrode substantially in contact with the outer surface of the second sealing member.

3,746,917

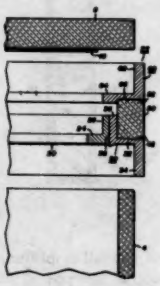
CAMERA TUBE WITH ACCURATE FIELD MESH MOUNTING MEANS

Raymond J. French, East Syracuse; Richard A. Wagner, West Monroe, and Richard E. Zehr, North Syracuse, all of N.Y., assignors to General Electric Company, Owensboro, Ky.

Continuation of Ser. No. 832,283, June 11, 1969, abandoned. This application May 13, 1971, Ser. No. 143,229

Int. Cl. H01j *31/28, 1/96, 29/02*

U.S. Cl. 313—65 R 5 Claims



An improved camera tube of the vidicon type has a field mesh accurately mounted between the target and the electron beam gun. The mesh is mounted in a manner to permit accurate spacing and parallel alignment with the target surface and to permit external electrical connections with the field mesh to be made without disturbing the electrical fields within the tube, providing a low inductance contact to the mesh particularly useful in high resolution tubes.

3,746,918

FOG REAR LIGHT

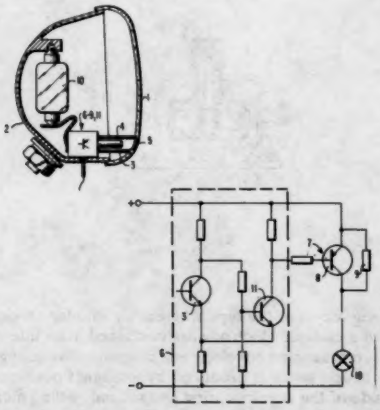
Gerhard Drucker, Stuttgart, and Reinhard Filsinger, Waiblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed May 24, 1971, Ser. No. 146,163

Claims priority, application Germany, May 23, 1970, P 20 25 302.5

Int. Cl. B60q *9/00*

U.S. Cl. 315—77 5 Claims



A fog tail light, especially for motor vehicles, in which the operating voltage applied across the fog lamp is varied as a function of the light intensity produced by headlights of a following vehicle in such a manner that in case of a high light intensity of the following headlights, the operating voltage is reduced and vice versa.

3,746,919

CONTROL DEVICE FOR LUMINESCENT LAMPS

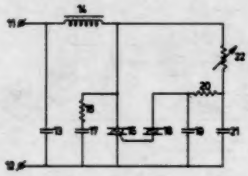
Robert Ronald Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands

Filed Apr. 16, 1971, Ser. No. 134,590

Claims priority, application Netherlands, Apr. 17, 1970, 7005575

Int. Cl. H05b *39/00*

U.S. Cl. 315—105 8 Claims



A light output control device which includes a controllable bidirectional semiconductor which with its mains current path is connected across the two filaments of a luminescent lamp. The firing moment of the semiconductor can be selectively set, so that the average lamp current in each half cycle of the a.c. voltage across the lamp can be controlled. During the intervals in which the semi-conductor is fired, a compensation current is flowing through the lamp filaments, by which proper ignition of the lamp during each half cycle of power source a.c. voltage is ensured.

3,746,920

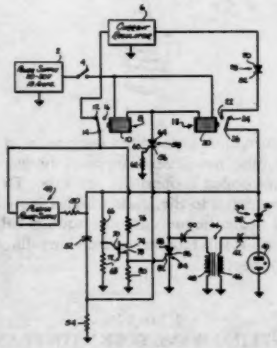
LIGHTWEIGHT XENON LAMP IGNITER

James P. Flatley, Norwich, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1971, Ser. No. 201,666

Int. Cl. H05b *37/00*

U.S. Cl. 315—170 7 Claims

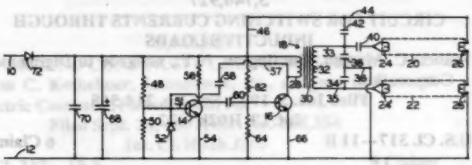


A high voltage diode in combination with a vacuum relay and a low voltage power supply provide an ignition circuit for a Xenon lamp, eliminating the use of a heavy and continuous duty high voltage pulse transformer. This permits appreciable reduction in weight of the ignition circuit, which also produces much less radio frequency interference than a conventional spark discharge type igniter.

3,746,921
FLUORESCENT LAMP CIRCUIT WITH LOW VOLTAGE SUPPLY

John J. Marshall, Grand Rapids, and David B. Dykehouse, Marshall, both of Mich., assignors to Progressive Dynamics, Inc., Marshall, Mich.

Filed Nov. 26, 1972, Ser. No. 202,427
Int. Cl. H05b *41/16*
U.S. Cl. 315—246 **10 Claims**

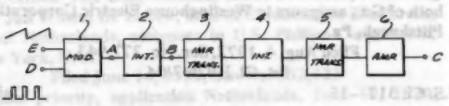


A transistorized feedback oscillator circuit for igniting and operating fluorescent lamps from a 12 volt direct current power source. The primary winding of a transformer is supplied by the interrupted current output of a power transistor, and the transformer secondary winding is connected to the electrodes of a fluorescent lamp or lamps. Low temperature operation is achieved by employing a temperature compensated resistor in the divider network biasing the power transistor base. Feedback from the power transistor is isolated from the base thereof through a driver transistor permitting operation on a full wave rectified pulsating direct current. A diode is employed for protecting the circuit against reverse polarity connection and continuous fluorescent lamp filament heating is produced by the direct current supply.

3,746,922
TV CIRCUIT FOR PRODUCTION OF PARABOLIC LINE-FREQUENCY VOLTAGE

Uwe Hartmann, Villingen, Germany, assignor to Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH, Villingen, Germany

Filed May 30, 1972, Ser. No. 257,685
Int. Cl. H01j *29/70*
U.S. Cl. 315—276 D **4 Claims**



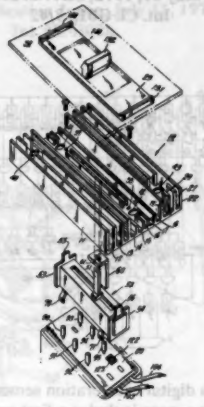
A television circuit for producing a parabolic line-frequency voltage, with the amplitude and phase of said voltage changing in accordance with frame frequency, employs a modulator circuit to generate a train of square-wave pulses at the line-frequency and being modulated in amplitude and phase at the frame rate. A first integrating circuit converts the squarewave pulses to a sawtooth train and a second integrating circuit converts the sawtooth train to a parabolic wavetrain modulated in amplitude and phase at the frame rate.

3,746,923
DIMMER SWITCH WITH LINEARLY MOVABLE CONTROL

Joel S. Spira, Allentown, and Joseph Licata, Schnecksville, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Oct. 18, 1971, Ser. No. 189,896
Int. Cl. H05b *37/02*
U.S. Cl. 315—291 **26 Claims**

A dimmer switch is provided with a linearly moving slider knob which is attached to a linearly moving potentiometer. The potentiometer is connected to the control circuit of a triac device to adjust the firing angle of the triac, thereby to control the dimming of the light. The dimmer switch is placed

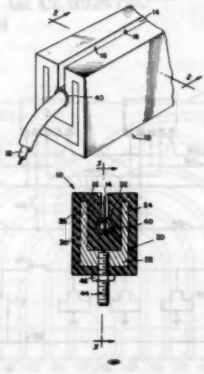


in a conventional wall box and is connected to the available wiring circuit. A switch connected in series with the device terminals is operated by the linearly moving slider when the switch reaches an end position in its travel.

3,746,924
STATIC ELIMINATOR

Anthony Q. Testone, West Point, Pa., assignor to Testone Electrostatics Corporation, West Point, Pa.

Continuation of Ser. No. 57,657, July 23, 1970, abandoned.
This application July 19, 1972, Ser. No. 273,252
Int. Cl. H01t *19/04*; H05f *3/00*
U.S. Cl. 317—2 F **12 Claims**

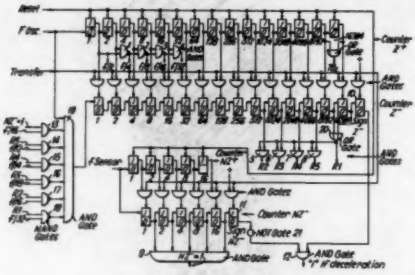


A static eliminator including a channel-shaped bar entirely enclosed in an insulating sheath: the sheath has a slot in and extending parallel to the channel, the slot at its inner end terminating in a cylindrical bore in which is a metal tube. Ionizing points penetrate into the metal tube and extend through the slot, and contacts are provided to the bar and tube from ground and to a source, respectively.

3,746,925
METHOD AND APPARATUS FOR DETERMINING CERTAIN ACCELERATIONS IN AN ANTISKID SYSTEM

Ellert Schaepman, Zurich, Switzerland, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 31, 1972, Ser. No. 258,170
Int. Cl. G01p 3/42
U.S. Cl. 317—5 18 Claims

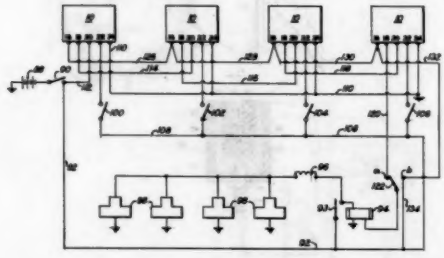


This relates to a digital acceleration sensor for use in an antiskid system. The sensor includes a first source of reference signals, a second source of wheel speed impulses, a first up-counter connected to the first source, a second down-counter coupled to the first source and the first counter, a third up-counter connected to the second source, a fourth downcounter coupled to the second source and the third counter, and logic circuitry coupled to the first source, the first counter, the second counter and the fourth counter. The counting value transferred to the second counter is counted down for a period determined by the fourth counter. The critical deceleration value to cause operation of the antiskid system is determined if the second counter changes its sign before the fourth counter has changed its sign.

3,746,926
SAFETY SYSTEM INCORPORATING A PLURALITY OF CONTROL SWITCHES

Buddy G. Sparks, Tulsa, Okla., assignor to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.

Filed Sept. 20, 1972, Ser. No. 290,565
Int. Cl. H02h 3/00
U.S. Cl. 317—9 B 13 Claims

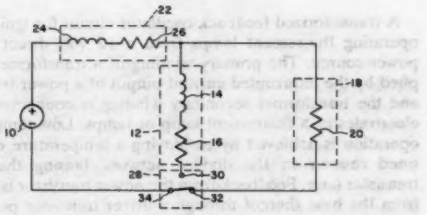


A safety system for signaling a malfunction of one of a plurality of elements in a driven instrumentality and for stopping the instrumentality. The system incorporates a control switch for each of the elements, each control switch having a signaling button that is movable between a retracted inactive position with respect to a case of the control switch and a projecting signaling position with respect to the case. A safety switch, which opens in response to a malfunction, is provided for each of the elements. Circuitry in the system linking the control switches, the instrumentality and the safety switches enables the instrumentality to operate when the buttons of all of the control switches are in their inactive positions, and all of the safety switches are closed. The opening of a safety switch, responsive to a malfunction, causes the button of the control switch associated with the open safety switch to move to its signaling position and causes the instrumentality to stop.

3,746,927
CIRCUIT FOR SWITCHING CURRENTS THROUGH INDUCTIVE LOADS

Francis C. Marino, Huntington, N.Y., assignor to Digitronics Corporation

Filed Jan. 3, 1972, Ser. No. 214,568
Int. Cl. H02h 7/22
U.S. Cl. 317—11 B 6 Claims

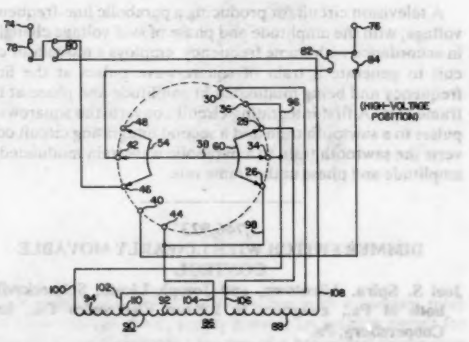


A circuit for switching current through an inductive load including a source of potential applying a current to a load having an inductive component, a switch for switching said load from a first condition to a second condition, and an auxiliary inductor connected in series with the switch and load and having an inductive value exceeding the inductive value of the inductive load whereby the current flowing through the auxiliary inductor varies only from the first state condition to the second state condition after switching.

3,746,928
DUAL-VOLTAGE TRANSFORMER WITH COORDINATED FUSING

Edgar R. Eley, Athens, and William E. Horton, III, Bogart, both of Ga., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1972, Ser. No. 277,943
Int. Cl. H02h 7/04
U.S. Cl. 317—15 5 Claims



Transformer apparatus having two high-voltage and two low-voltage fuses, a dual-voltage winding assembly, and a two-position rotor switch which connects the fuses and the winding

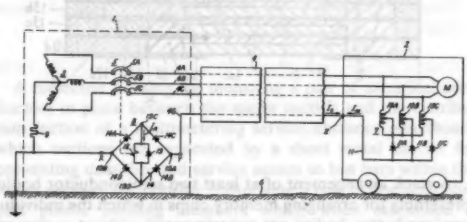
assembly to line terminals. When the switch is in the high-voltage position, all of the turns of the winding assembly are connected in series and to the line terminals through the high-voltage fuses and through one low-voltage fuse. When the switch is in the low-voltage position, some of the turns of the winding assembly are connected in parallel with each other and to the line terminals. In the low-voltage position, the total line current flows through the low-voltage fuses and one-half of the total line current flows through one of the high-voltage fuses.

3,746,929

GROUND CONTINUITY CHECKING SYSTEM

William C. Kotheimer, Lansdowne, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Sept. 28, 1971, Ser. No. 184,354
Int. Cl. H02h 3/16
U.S. Cl. 317—18 A 8 Claims



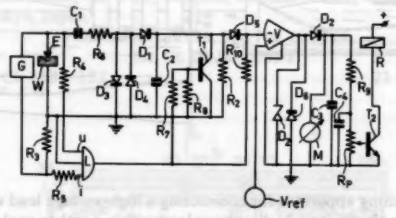
A fail-safe-ground conductor continuity monitoring circuit including means for inserting a low-level monitoring current into a ground conductor and receiver means for sensing if the level of current in the ground conductor is below a predetermined level and for tripping a circuit breaker if the current is below that level for a predetermined period of time. The receiver also includes means for insuring that the current in the receiver does not reverse as a result of stray ground currents or power currents in the ground conductor.

3,746,930

APPARATUS FOR DETECTING ARCS

Jasper Anton Van Best, Utrecht; Ernst Frederik Avenarius, and Jan Willem De Zeeuw, both of Emmasingel, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1971, Ser. No. 152,523
Claims priority, application Netherlands, June 18, 1970, 7008914
Int. Cl. H02h 7/00
U.S. Cl. 317—31 16 Claims



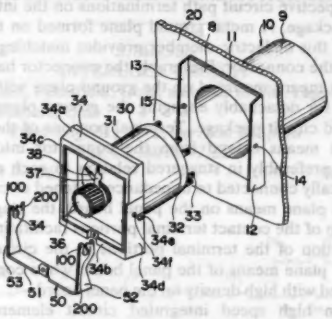
Apparatus for detecting the occurrence of an arc during a spark erosion process is based upon the principle that the noise component of the voltage across the discharge gap disappears when an arc occurs. The noise voltage is detected and compared with a reference voltage in a discriminator circuit. A signal from a logic circuit is also applied to the discriminator which determines the presence of a current through, and of a voltage across, the spark discharge gap.

3,746,931

INSTRUMENT MOUNTING ASSEMBLY WITH TIMER CAMMING ARRANGEMENT

Tsutomu Muranaka, Okayama, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed July 31, 1972, Ser. No. 276,308
Claims priority, application Japan, July 31, 1971, 46/68712
Int. Cl. H02b
U.S. Cl. 317—99 22 Claims



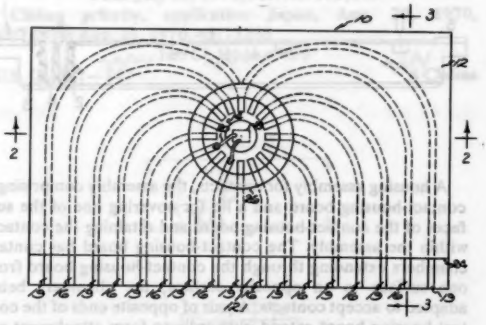
An instrument or timer mounting assembly which comprises an instrument or timer module and its mating mounting receptacle adapted to receive therein the instrument or timer module. This mounting assembly is provided with a manually operable handle formed near its open ends with a pair of fingers; one of which is adapted to draw the module toward the mating receptacle as the handle is rotated to secure the module to the receptacle and the other of which is adapted to separate the module, that has been secured to the receptacle, away from the receptacle, based on the principle of leverage, as the handle is rotated in the opposite direction.

3,746,932

PANEL BOARD SYSTEMS AND COMPONENTS THEREFOR

Warren R. Hogan, and Reidar G. Larsen, both of Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1970, Ser. No. 101,564
Int. Cl. H02b 1/02
U.S. Cl. 317—101 DH 13 Claims



A panel board system particularly adapted for mounting high speed integrated circuit devices is shown to include integrated circuit packages, connectors and panel board means which each incorporate impedance matching means to provide for complete integrity of the system. The integrated circuit packages have an integrated circuit chip mounted on one

side of a ceramic card and have the chip electrically connected to a plurality of printed circuit paths formed on the same side of the card. These circuit paths terminate in closely spaced relation to each other along one edge of the card and a metal ground plane is formed on the opposite side of the card to provide controlled impedance in the integrated circuit package. Each connector receives an edge of an integrated circuit package and has a plurality of contact means located in closely spaced relation to each other along one side of a dielectric member within the connector for detachably engaging respective circuit path terminations on the integrated circuit package. A metal ground plane formed on the opposite side of this dielectric member provides matching impedance within the connector. Preferably the connector has additional contact means mounted on the ground plane within the connector for detachably engaging the ground plane on the integrated circuit package. Terminal portions of the connector contact means extend from the connector into the panel board, preferably in staggered relation to each other, to be electrically connected to impedance matched circuit path and ground plane means on the panel board, the staggered relationship of the contact terminal portions facilitating electrical connection of the terminal portions to the circuit path and ground plane means of the panel board when connectors are mounted with high density on the panel board.

When high speed integrated circuit elements such as emitter-coupled logic (ECL) devices and the like are mounted on a conventional panel board system, the performance of the system is limited by the performance of the means employed in the conventional system for electrically connecting the integrated circuits to circuit elements on the panel board. These performance limitations primarily result from the circuit arrangements provided within conventional integrated circuit packages themselves and from the means conventionally employed in making electrical connections between the integrated circuit packages and connectors mounted on the panel board.

3,746,933

HOUSING ASSEMBLY FOR CONTACTS

Heinz Wolfgang Knitter, Heilbronn, and Joseph Veszelik, Weinsberg, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 10, 1972, Ser. No. 242,562

Claims priority, application Germany, Apr. 23, 1971, P 21 19 987.1

Int. Cl. H02b 1/04

U.S. Cl. 317—101 CC **1 Claim**

A housing assembly for contacts, the assembly comprising a contact-housing board and a lid for covering one of the surfaces of the contact-housing board and retaining the contacts within the assembly. The contact-housing board has contact chambers extending through the contact-housing board from one surface to an opposite surface, the chambers being adapted to accept contacts. A pair of opposite ends of the contact-housing board extend outwardly to form attachment extensions, and each of these extensions has a mounting hole extending through the extension. The lid also has extensions which overlap the mounting holes in the contact-housing board. The lid extensions have openings that are aligned with the mounting holes. The contact-housing board and the lid can be securely held together and mounted to a mating part through the mounting holes and the openings. In a preferred embodiment, the lid is provided with flanges extending over the sides of the contact-housing board, and the flanges have recesses which interlock with mating cams on the sides of the contact-housing board so that the two parts can be snap fastened together.

3,746,934

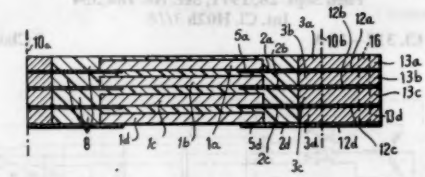
STACK ARRANGEMENT OF SEMICONDUCTOR CHIPS

Karl-Ulrich Stein, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 6, 1971, Ser. No. 140,682

Int. Cl. H05k 1/04

U.S. Cl. 317—101 CM **3 Claims**



A stack arrangement of at least two semiconductor bodies, preferably for arranging memory chips in which the individual semiconductor bodies are superimposed without casing and carrier plates. The edges of the semiconductor bodies have electrically conductive wires extending perpendicularly to the planes of the bodies.

3,746,935

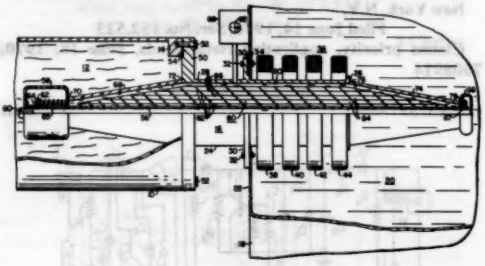
ELECTRICAL BUSHING SUITABLE FOR ATTACHMENT BETWEEN TWO ELECTRICAL APPARATUS ENCLOSURES

Loren B. Wagenaar; Walter F. True, and Saul Bennon, all of Muncie, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1972, Ser. No. 227,555

Int. Cl. H01b 17/26; H02b 1/00

U.S. Cl. 317—103 **4 Claims**

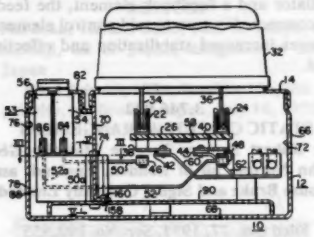


Bushing apparatus for connecting a high-voltage lead within one enclosure to a high-voltage lead within another enclosure. A center member is connected to each enclosure with a lead tube extending coaxially therethrough. Epoxy casing structures, having a smooth outer surface, are disposed around said lead tube within each enclosure. Means attached to the lead tube ends applies compressive forces on the casings and center member to seal the bushing. Flanges on the center member are used for connecting the bushing body to the enclosures.

3,746,936
DIELECTRIC HOUSING FOR ELECTRICAL CONDUCTORS IN A METER HOUSING

William F. Coffey; Kenneth R. Coley, both of Stratford, and Emmett J. McLaughlin, Fairfield, all of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 30, 1971, Ser. No. 203,217
Int. Cl. H02b 1/20
U.S. Cl. 317—120 9 Claims

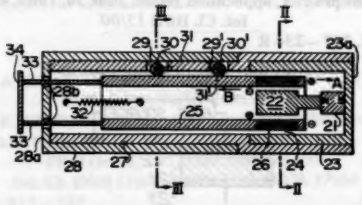


A dielectric housing for mounting a pair of electrical conductors in place between the meter section and the distribution section of a multimetering service entrance panelboard which sections are separated by a sheet metal barrier for preventing unauthorized service access to bus bars within the meter section; the housing comprising a pair of duplicate die-cast plastic housing members which when assembled is located within an opening in the barrier for mounting and maintaining a pair of conductors in place between the meter section and the distribution section; the assembled housing members having external grooves for engagement with peripheral portions of the barrier forming the opening for the dual purpose of supporting the housing in place and of preventing access to the meter section through the opening; and the assembled housing members also comprising an enclosed compartment through which the conductors extend and in which integral projection portions of the two housing members are disposed in transverse alignment for maintaining prescribed spacing between the conductors; and the housing members having pairs of spaced conductor-receiving openings in the end walls and edge walls which openings are enlarged at the outer surfaces of the end and edge walls for providing greater oversurface clearance between the conductors than air clearance, and which housing members include corresponding projections and recess means at the walls of the abutting members for increasing the oversurface clearance or electrical creepage distance between the conductors and the barrier.

3,746,937
ELECTROMAGNETIC LINEAR MOTION DEVICE

Hiroshi Koike, No. 5-10, 1-chome, Minami-Azabu, Minato-ku, Tokyo, Japan

Filed July 12, 1971, Ser. No. 161,706
Int. Cl. H02k 41/02
U.S. Cl. 318—122 21 Claims

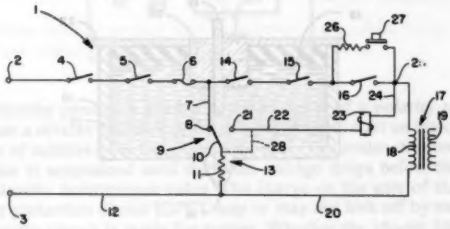


Herein disclosed is an electromagnetic linear motion device having an armature or movable core which is wrapped with a control coil cutting across a magnetic field established through a rectilinear air gap which is defined by inner and outer pole pieces having opposite polarities and positioned in parallel to and at least partly coextensive to each other. The device uses a support mechanism including bearings to longitudinally movably support the movable core and resilient suspension means which is adapted to have the movable core balanced in the longitudinal direction of the device. Such device can be used as a linear motor or a signal generator where minute and precise linear motions are required.

3,746,938
INTERLOCK CIRCUIT

John T. Lamb, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Aug. 31, 1972, Ser. No. 285,466
Int. Cl. H01h 47/22
U.S. Cl. 317—136 10 Claims

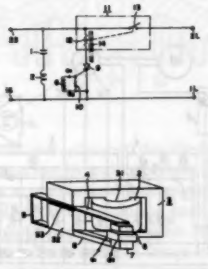


An interlock circuit providing electric power to a transformer or other electric device in response to one or more sensed conditions interrupts such power upon the cessation of one of the sensed conditions. The circuit includes at least one interlock switch, a current limiting fuse, a ballast resistor for drawing current through the fuse upon the cessation of one of the conditions to open the circuit, and a relay monitoring operability of the ballast resistor when energized to close an associated switch connecting the circuit for operation.

3,746,939
RECEIVER FOR CENTRALIZED CONTROLLING APPARATUS

Katsumi Taketa; Akeyoshi Miyoshi, and Terutomo Kobayashi, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 22, 1971, Ser. No. 165,073
Claims priority, application Japan, Aug. 20, 1970, 45/72878; Aug. 21, 1970, 45/73235
Int. Cl. H01h 47/20
U.S. Cl. 317—147 6 Claims



A receiver for a centralized controlling apparatus is used for switching a load at a given remote location upon the receipt of a transmission of a specific frequency signal from a station

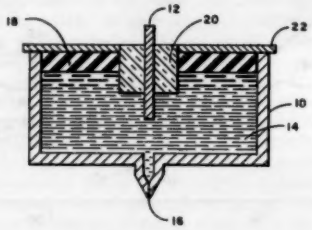
through a transmission or distribution line. In the receiver, a serially connected resonance coil and condenser are provided and resonated by the specific frequency signal transmitted through the transmission or distribution line. A mechanical resonator is vibrated in accordance with the resonance of the resonance coil and condenser to thereby change the magnetic flux in a magnetic circuit and to provide an induced voltage in a coil for detecting the specific frequency signal. A switching element is triggered by the induced voltage to actuate a differential relay and to thereby switch a load circuit.

3,746,940

NON-AQUEOUS CADMIUM COULOMETER

Charles R. Walk, King of Prussia, and Sandors G. Abens, Philadelphia, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 1, 1971, Ser. No. 177,036
Int. Cl. H01g *9/00*
U.S. Cl. 317—230 **6 Claims**



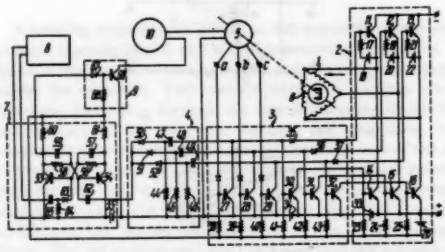
An electrolytic cell including an electrolyte solution, a first electrode having a cadmium surface in contact with and electrochemically active with the electrolyte and a second electrode, which is insulated or spaced from the first electrode. The second electrode has a surface in contact with and chemically inert to the solution. The electrolyte comprises a solution of an alkali metal-cadmium-iodide complex in methyl formate. The electrolytic cell may be used as a plating cell for depositing cadmium electrolytically on the surface of the second electrode. It also may be used as a coulometer, to measure the number of coulombs deposited during plating. Accordingly the cell may be used as a timing device where the superior characteristics are needed.

3,746,941

DEVICE FOR CONTROLLING THE SPEED OF A D. C. MOTOR WITH A NONCONTACT SWITCH

Vladimir Egorovich Ageev, ulitsa Berezovaya Roscha, 58, kv. 26; Vera Evgenievna Bukatova, ulitsa Perevertkina, 58, kv. 14, and Oleg Alexandrovich Dmitriev, ulitsa Koltsovskaya 112, kv. 15, all of Voronezh, U.S.S.R.

Filed Oct. 7, 1971, Ser. No. 187,309
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **2 Claims**



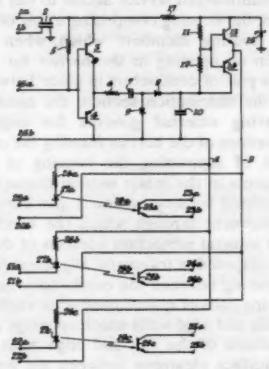
An apparatus for controlling a d.c. motor which has neither a current collector nor brushes, and employs a rotor in the form of a permanent magnet; the d.c. motor has a plurality of phase windings on the stator. A brushless commutator of the motor is connected to the stator windings, as a result of which a field is induced in which field the rotor rotates. The commutator is also connected to a control element which is energized from a rotor-position sensor connected to a secondary power supply source. A semiconductor key controlled by a phase sensitive element is connected between the rotor-position sensor and said secondary power supply source. The phase sensitive element is, in turn, controlled by a variable frequency master oscillator and a feedback element, the feedback element being connected in turn to said control element. The apparatus ensures increased stabilization and effective regulation of speed.

3,746,942

STATIC CIRCUIT ARRANGEMENT

Christopher Robert Brown; Terence Malcolm George, and David John Norton, all of London, England, assignors to Westinghouse Brake and Signal Company Limited, London, England

Filed Oct. 27, 1971, Ser. No. 192,855
Claims priority, application Great Britain, Oct. 29, 1970, 51,334/70
Int. Cl. H03h *17/00*
U.S. Cl. 317—148.5 R **13 Claims**



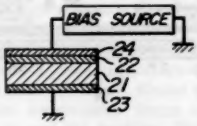
This disclosure relates to a static relay having an electronic coil circuit and an electronic contact circuit. The electronic coil circuit includes a pair of d.c. supply terminals and a pair of control terminals. The condition of the electronic contact circuit is controlled in accordance with the electrical state of the control terminals of the electronic coil circuit.

3,746,943

SEMICONDUCTOR ELECTRONIC DEVICE

Masaharu Aoki, Tokyo; Hiroyuki Kasano, Akishima; Kazuhiro Kurata, Hachioji, and Masahiko Ogirima, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 29, 1970, Ser. No. 50,870
Claims priority, application Japan, June 30, 1969, 44/51609
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R **1 Claim**



A semiconductor electronic device having an n-type semiconductor body obtained by doping a crystal of a group

III-V compound semiconductor with germanium to form a shallow donor level of germanium therein so that this shallow donor level is utilized for radiating electroluminescence or producing bulk oscillation, and a method of fabricating such a crystal by the epitaxial growth of the crystal on one surface of a germainum substrate whose opposite surface is coated with a GaP layer.

3,746,944

CONTACT MEMBERS FOR SILICON SEMICONDUCTOR DEVICES

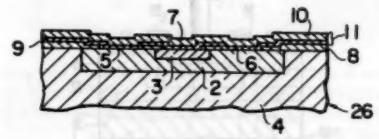
Kiyotake Naraoka; Hisumi Sano, both of Tokyo, and Yokichi Itoh, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 12, 1971, Ser. No. 161,786

Claims priority, application Japan, July 10, 1970, 45/59913

Int. Cl. H01l *3/00*

U.S. Cl. 317—234 R **7 Claims**



A contact and interconnection arrangement for a silicon semiconductor device with a silicon oxide coating, which comprises a double layer composed of a thin layer of molybdenum-nickel alloy and a thin layer of gold, or which comprises a triple layer composed of a thin layer of molybdenum-nickel alloy, a thin layer of silver or copper, and a thin layer of gold, whereby the molybdenum-nickel alloy contains 5 to 50 percent of nickel by weight.

3,746,945

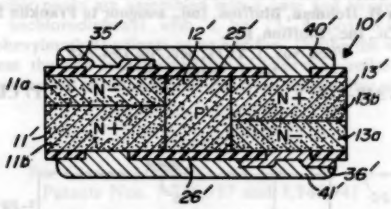
SCHOTTKY DIODE CLIPPER DEVICE

Peter J. C. Normington, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 27, 1971, Ser. No. 194,608

Int. Cl. H01l *5/00*

U.S. Cl. 317—235 R **7 Claims**



A pair of Schottky barrier diodes formed on a single substrate of semiconductor material so that they are connected in a parallel opposed relationship and a lead may be attached to each side thereof in axially outwardly extending relationship.

3,746,946

INSULATED GATE FIELD-EFFECT TRANSISTOR INPUT PROTECTION CIRCUIT

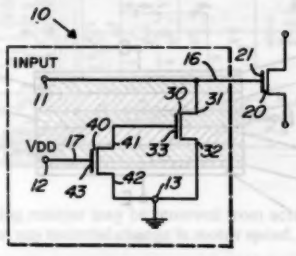
Lowell E. Clark, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 2, 1972, Ser. No. 293,959

Int. Cl. H01l *11/00*; H02h *7/20*; H03k *17/60*

U.S. Cl. 317—235 **6 Claims**

A circuit for protecting an insulated gate field-effect transistor (IGFET) circuit from damage caused by spurious, high voltage inputs resulting primarily from static charge is made up of a pair of IGFET's. A first protection circuit IGFET has a drain connected to the gate of at least one main circuit IGFET to be protected, the gate of the main circuit IGFET being connected to an input terminal. The source of the first protection circuit IGFET is connected to a common reference. The gate of the first protection circuit IGFET is connected to the drain of a second protection circuit IGFET whose source is connected to the common reference and whose gate is connected to a discharge terminal for applying a voltage to the gate sufficient to turn on the second protection circuit IGFET. The first protection circuit IGFET goes into an



avalanche condition when a spurious signal of a polarity to cause a reverse bias is of sufficient amplitude to start an injection of carriers from the drain to the gate. The avalanche condition is maintained until the drain voltage drops below the avalanche maintenance value. The charge on the gate of the first protection circuit IGFET may or may not leak off by the time the circuit is ready for testing. Whether the charge has leaked off or not is of no consequence because when the circuit is connected to the tester, a voltage is applied to the gate of the second protection circuit IGFET turning it on and causing the charge on the gate, if any, of the first protection circuit IGFET to be conducted to ground.

3,746,947

SEMICONDUCTOR DEVICE

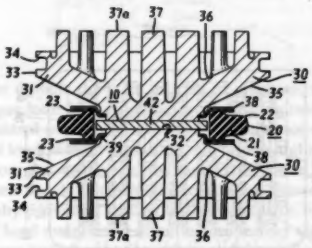
Isamu Yamamoto; Mamoru Ueda, and Yoshitada Yoneda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1970, Ser. No. 18,224

Claims priority, application Japan, Mar. 15, 1969, 44/19726

Int. Cl. H01l *5/00*

U.S. Cl. 317—234 R **7 Claims**



A flat semiconductor element disposed within a hollow cylindrical insulation has its main opposite faces each in pressure contact with a smaller end face of an electrodes in the form of truncated hollow cone closing each end of the insulation. The electrode is provided at the smaller end with a resilient flange welded to a resilient flange on the adjacent end of the insulation and has many protrusion extend from the recessed larger end portion for cooling purpose. A cover can seal the larger end portion to circulate a coolant around the protrusions.

3,746,948

SEMICONDUCTOR STRUCTURE INCORPORATING TUNNEL DIODES LOCATED IN THE PATH OF THE MAIN CURRENT FLOW

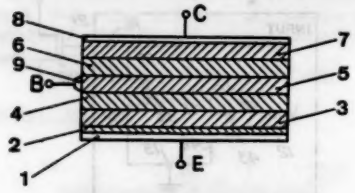
Alois Marek, Nussbaumen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 18, 1971, Ser. No. 144,485

Claims priority, application Switzerland, May 26, 1970, 7786/70

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R 1 Claim



A semiconductor element comprises a disc of semiconductor material which includes at least four active layers of alternatively opposite conductivity type having attached metallic electrodes to each of the outside layers. In order to avoid the local over-heating in small regions of the active part of the element there are arranged at least two tunnel junctions between at least three consecutive layers in the main current path and the said three consecutive layers are attached to the layer or the layer junction which determines the current density of the device.

3,746,949

SEMICONDUCTOR DEVICE

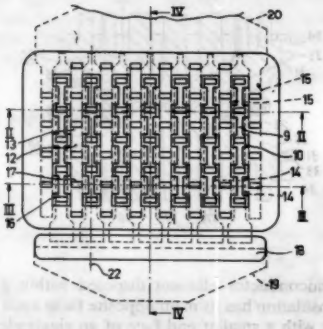
Rijkent Jan Nienhuis, and Theodorus Hubertus Josephus van den Hurk, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,077

Claims priority, application Netherlands, Oct. 10, 1970, 7014890

Int. Cl. H01l *5/00*

U.S. Cl. 317—235 R 8 Claims



A semiconductor device having a transistor structure with strip-shaped emitter regions. The emitter regions as well as the intermediate regions of the base zone according to the invention comprise alternately narrower and wider parts, the emitter and base contact windows being provided only above the wider parts.

3,746,950

PRESSURE-SENSITIVE SCHOTTKY BARRIER SEMICONDUCTOR DEVICE HAVING A SUBSTANTIALLY NON-CONDUCTIVE BARRIER FOR PREVENTING UNDESIRABLE REVERSE-LEAKAGE CURRENTS AND METHOD FOR MAKING THE SAME

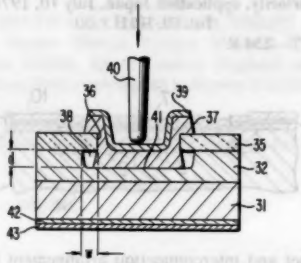
Gota Kano, Otokuni-gun; Mutsuo Iizuka, Kitakawachi-gun; Shohei Fujiwara; Hiromasa Hasegawa, both of Takatsuki City, and Tsukasa Sawaki, Toyonaka, all of Japan, assignors to Matsushita Electronics Corporation, Oaza-Kadoma, Kadoma City, Osaka Prefecture, Japan

Filed Aug. 15, 1969, Ser. No. 850,372

Claims priority, application Japan, Aug. 27, 1968, 43/61958

Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235 R 15 Claims



A pressure-sensitive semi-conductor device with a Schottky barrier in which a separation space is formed underneath the insulating film covering a major surface portion of the semiconductor substrate and disposed adjacent a metal layer received in a recess in the substrate and extending through an opening in the insulating film, whereby the input pressure is applied to the metal layer. The separation space is formed by side-etching with the insulating film serving as mask.

ERRATA

For Classes 317—258 and 317—259 see: Patents Nos. 3,746,952 and 3,746,953

3,746,951

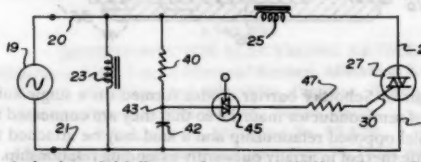
SWITCHING CIRCUIT FOR MOTOR START WINDING

William H. Hohman, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Nov. 1, 1971, Ser. No. 194,745

Int. Cl. H02p *1/44*

U.S. Cl. 318—221 E 17 Claims



A thyristor initially couples a start winding of an AC motor to AC power, and then uncouples the start winding when the motor reaches a preselected cut-out speed. A thyristor control circuit, having impedance elements connected across a main winding of the AC motor and connected to the thyristor, monitors motor speed by sensing the relative phase difference between start winding current and applied voltage. Several embodiments are disclosed, including a simplified circuit for generating spaced pulses for controlling the thyristor. Other embodiments include circuits which prevent false triggering of the thyristor in its second and fourth quadrants of operation, and effectively produce equal firing characteristics in its first and third quadrants of operation.

3,746,952

ELECTRICAL APPARATUS COMPRISING PERFLUOROAZAOLEFIN AS LIQUID DIELECTRIC

Bryce C. Oxenrider, Florham, N.J.; Cyril Woolf, Morristown, N.J., and Wilhelmus M. Beyleveld, Deventer, Netherlands, assignors to Allied Chemical Corporation, Morristown, N.J.

Filed July 9, 1971, Ser. No. 161,934
Int. Cl. H01g *1/00, 3/04*
U.S. Cl. 317—258 5 Claims

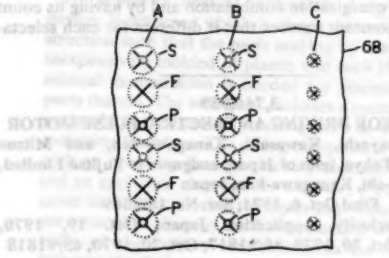
Perfluoroazaolefins are useful as liquid dielectrics in electrical apparatus.

3,746,953

ELECTRICAL CAPACITOR

John Lapp, Franklin, and Norbert R. Weiler, Greendale, both of Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed May 19, 1972, Ser. No. 255,156
Int. Cl. H01g *3/04*
U.S. Cl. 317—259 58 Claims



A power factor correction capacitor is constructed of several capacitor packs, each having convolutely wound layers of aluminum foil and polypropylene film with two layers of polypropylene film between the layers of foil. The several capacitor packs are assembled into a case and impregnated with trichlorodiphenyl with a bis (3, 4-epoxy-6-methylcyclohexylmethyl) adipate as an additive. During the winding process the foil is deformed by a deforming roller rolled against the roll of foil as it is wound into the capacitor pack.

ERRATA

For Classes 318—122 and 318—138 see:
Patents Nos. 3,746,937 and 3,746,941

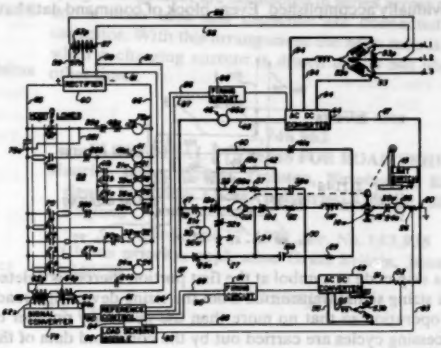
3,746,954

ADJUSTABLE VOLTAGE THYRISTOR-CONTROLLED HOIST CONTROL FOR A DC MOTOR

Asa H. Myles, Solon, and Fred Erb, Northfield, both of Ohio, assignors to Square D Company, Park Ridge, Ill.

Filed Sept. 17, 1971, Ser. No. 181,515
Int. Cl. H02p *5/06*
U.S. Cl. 318—247 21 Claims

A direct current series motor is powered by adjustable voltage from an alternating current source. The motor is series connected during hoisting and powered by a single AC-DC converter, and shunt connected during lowering with a second AC-DC converter supplying the field. An isolation resistor permits dynamic lowering and provides emergency dynamic braking even with the independently energized armature and field. A teaser field resistor which prevents overspeeding when the motor is hoisting a light load is automatically disconnected while the motor is hoisting a sufficiently heavy load and is reconnected if the load becomes too small. During lowering, a



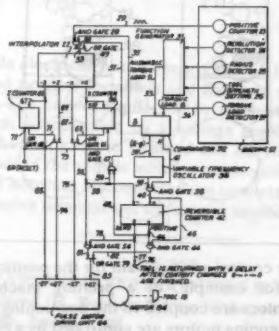
dynamic braking resistor may be removed from across the armature without any material change in motor speed.

3,746,955

ADAPTIVE CONTROL SYSTEM FOR NUMERICAL CONTROL OF A CUTTING TOOL

Kengo Kobayashi, Kawasaki-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 23, 1971, Ser. No. 127,221
Claims priority, application Japan, Mar. 24, 1970, 45/24594
Int. Cl. G05b *13/00*
U.S. Cl. 318—561 5 Claims



A detector detects the state of load of machine, for example, the torque load of the spindle or the cutting resistance of the tool. Control means connected to the detector compares the detected load with an allowable magnitude and moves the tool away from the workpiece in a specific direction to reduce the load when the detected load exceeds the allowable magnitude thereby providing cutting of the workpiece by the tool at a state of load maintained at a magnitude very close to the allowable magnitude by not exceeding such magnitude.

3,746,956

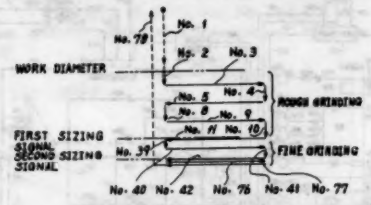
TAPE-READING CONTROL SYSTEM FOR REPEAT-PROCESSING CYCLES OF TRAVERSE CUTTING

Hiroyasu Takegawa, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Apr. 2, 1971, Ser. No. 130,709
Int. Cl. G05b *19/24*
U.S. Cl. 318—572 8 Claims

In a control system for grinding machines, the grinding operation is performed in a plurality of processing cycles, each

of which is controlled according to command data stored in blocks on a tape. A sizing device is adapted to directly measure a workpiece diameter each time the processing cycles are individually accomplished. Every block of command data having a skip code or symbol at the first portion thereof is deleted by a sizing signal transmitted from the sizing device in a reading operation so that no more than the necessary number of processing cycles are carried out by the command data of the remaining blocks.



3,746,957

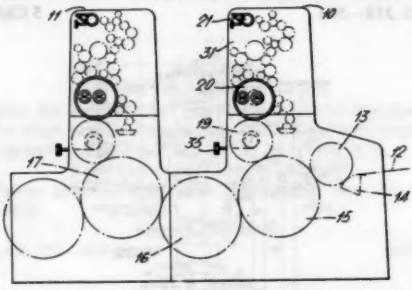
APPARATUS FOR REMOTE CONTROL OF POSITIONING AND DRIVE MEMBERS FOR PRINTING MACHINES

Karl-Heinz Forster, Dresden; Lothar Vetter, Radebeul; Hans Johne, Radebeul, and Klaus Schanze, Radebeul, all of Germany, assignors to VEB Polygraph Leipzig Druckmaschinenwerk Planeta Rabebeul, Radebeul, Germany

Filed Sept. 16, 1970, Ser. No. 72,737

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **11 Claims**



A remote control arrangement for the positioning and drive members, for example, of a printing machine, in which stepping motors are coupled to the positioning or drive members. The stepping motors are controlled by a control network which is responsive to a single input pulse of determined duration for applying a series of successive control pulses to the stepping motors, so that the rotors of the stepping motors are in electrically similar positions, with respect to their stators, before and after each control pulse series. Means are provided for mechanically coupling the stepping motors to their respective positioning and drive members to obtain stepwise axial movement or rotation of the positioning or drive members. An input circuit of the control network may be provided to enable single step movement, continuous movement, or continuous movement for a preselected number of steps.

3,746,958

MOTOR CONTROL FOR A STEPPING MOTOR

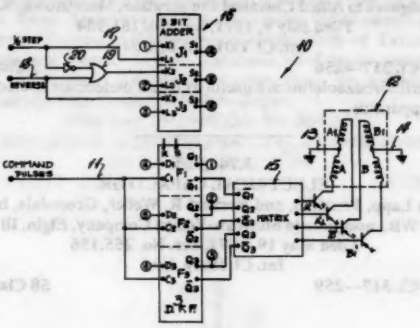
Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Nov. 10, 1971, Ser. No. 197,239

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **9 Claims**

A motor control for a stepping motor having windings whose energizations are changed according to a sequence with each change producing a movement and with each change being commanded by an input pulse. The motor control enables each movement to be selected as either a full step or a half step in either a forward or reverse direction for each pulse by the use of a counter having a different count for each possible winding energization combination and by having its count changed a constant number that is different for each selectable movement.



3,746,959

CIRCUIT FOR DRIVING AN ELECTRIC PULSE MOTOR

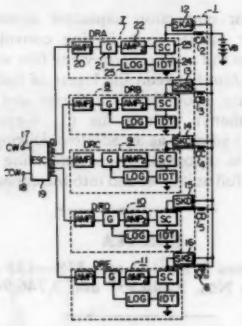
Kengo Kobayashi, Kawasaki, Kanagawa-ken, and Mitsuo Manabe, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Kanagawa-ken, Japan

Filed Oct. 6, 1971, Ser. No. 186,869

Claims priority, application Japan, Oct. 19, 1970, 45/91810; Oct. 20, 1970, 45/91817; Oct. 20, 1970, 45/91818

Int. Cl. H02k *37/00*

U.S. Cl. 318—696 **7 Claims**



The circuit for driving the electric pulse motor of the present application supplies a large amount of current to the exciting coil of the pulse motor when the rotor of the motor is in a step condition, and a small amount of current when in the stop condition. For this purpose, the circuit of the present invention provides a current detecting circuit in series with the exciting coil. By detecting the current flowing in said current detecting circuit when the rotor is in the step condition, a relatively wide voltage pulse is applied to the exciting coils, and in the stop condition a voltage pulse having a narrow width is applied to the exciting coil. Further improving the starting characteristics and the response characteristics of the pulse motor, the circuit of the present invention provides a spark killer circuit, that is, an integrating circuit which is composed of capacitors and resistors and diodes in parallel with the exciting coil.

3,746,960

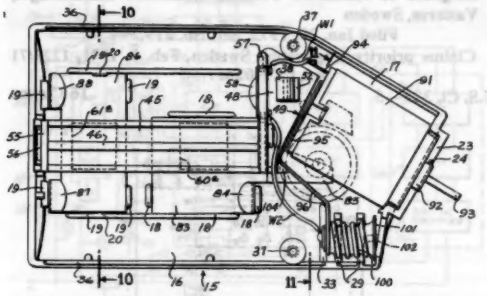
HAND APPLIANCE DEVICE AND ITS ENCLOSURE

George R. Fraser, 4250 Fourth Avenue, San Diego, Calif.

Filed Dec. 23, 1971, Ser. No. 211,198

Int. Cl. F21l 7/00

U.S. Cl. 320—2 29 Claims



An appliance device, particularly designed as an erasing device, is disclosed which is motor driven and having a construction such that the parts making up the enclosure can be inexpensively molded of plastic and such that a minimum of manual manipulation is needed for assembling the working parts therein. The enclosure includes a casing of at least three parts which encloses the working parts as well as providing a mounting therefore. The casing comprises a chamber member with an open top having a battery chamber for the batteries and an appliance chamber for a motor, a frame member and cover means for closing the open top. Two battery contacts are secured in place by the frame member which extends centrally of the battery chamber with the contacts located between the frame member and the bottom of the chamber member. Also a battery contact is constructed to serve as a switch element. A light socket preferably is provided for a light to beam its illumination towards the work area. The construction by which the battery contacts, the motor and the light socket are mounted in the casing is simple as to the parts required and for the assembly operation. The invention includes the enclosure or casing with its frame member as well as the complete appliance device.

3,746,961

BATTERY CHARGING CIRCUIT

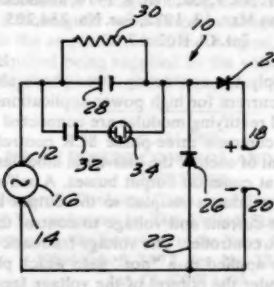
Alexander Barbour Dobie, Newcastle upon Tyne, England, assignor to Ronson Corporation, Woodbridge, N.J.

Filed Sept. 14, 1972, Ser. No. 289,181

Claims priority, application Great Britain, Sept. 24, 1971, 44,740/71

Int. Cl. H01m 45/06

U.S. Cl. 320—48 8 Claims



A battery charger for recharging a rechargeable battery cell wherein an indication is given as to whether charging current is being drawn. In the charging circuit a capacitor and a rectifying arrangement are connected in series across an ac source and a neon tube and capacitor are connected across the capacitor. With this arrangement the neon tube is illuminated when a charging current is drawn and is not illuminated at other times.

3,746,962

ELECTRICAL SYSTEMS FOR ROAD VEHICLES

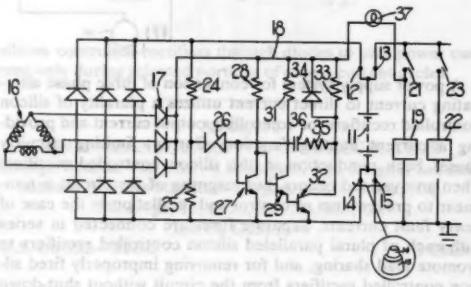
Maurice James Wright, Quinton, Birmington, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed June 17, 1971, Ser. No. 153,935

Claims priority, application Great Britain, June 17, 1970, 29,340/70

Int. Cl. H02j 7/14

U.S. Cl. 320—61 1 Claim



A vehicle electrical system incorporates a battery with first and second positive terminals and first and second negative terminals. The battery is charged by a generator, the output from which is controlled by a voltage regulator connected between the first positive terminal and the first negative terminal. Loads of the vehicle which are susceptible to damage if the battery becomes disconnected are connected between the second positive terminal and the second negative terminal.

3,746,963

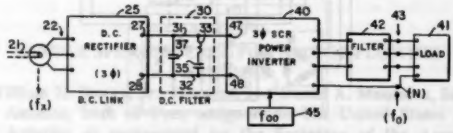
POLYPHASE INVERTER WITH D.C. SUPPLY

Dan L. VeNard, II, Bonners Ferry, Idaho, assignor to Static Power, Inc., Irvine, Calif.

Continuation of Ser. No. 868,455, Oct. 22, 1969, abandoned. This application June 9, 1971, Ser. No. 151,598

Int. Cl. H02m 5/44

U.S. Cl. 321—2 3 Claims



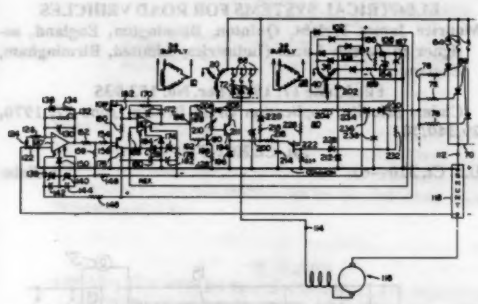
Polyphase static inverter system of substantial power rating, energized by a direct current source. The source output is filtered to maintain smooth unidirectional power input to the silicon controlled rectifier array of the inverter. The filtering utilizes a shunt trap, tuned to twice the frequency of the system power output. Significant economy and reduction in size and weight for the filtering are realized.

3,746,964

POWER SUPPLY SYSTEM FOR HEAVY TRACTION LOADS

William V. Guyton, Clackamas, Oreg., assignor to Sol-Tek Industries, Inc., Troutdale, Oreg.

Filed Jan. 4, 1971, Ser. No. 103,724
Int. Cl. H02m 1/18, 7/20; H02k
U.S. Cl. 321—5 3 Claims



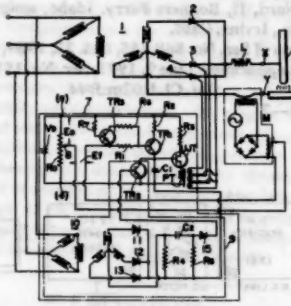
A power supply system for conversion of three phase alternating current to direct current utilizes a plurality of silicon controlled rectifiers for controlling output current and providing a current limiting function. Current limiting circuitry phases back conduction in the silicon controlled rectifiers when an overload occurs, but response of the circuit is nonlinear to prevent loss of control and oscillation in the case of heavy fault currents. Separate fuses are connected in series with each of plural paralleled silicon controlled rectifiers to promote load sharing, and for removing improperly fired silicon controlled rectifiers from the circuit without shut-down of the entire supply.

3,746,965

DIRECT CURRENT ARC WELDER

Toshiyuki Okada, Sumiyoshi-ku; Osaka-shi, and Muritoshi Nagasaka, Nishinari-ku, Osaka-shi, both of , Japan, assignors to Osaka Transformer Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Aug. 31, 1971, Ser. No. 176,613
Claims priority, application Japan, Aug. 31, 1970, 45/75631
Int. Cl. H02m 7/20
U.S. Cl. 321—5 9 Claims



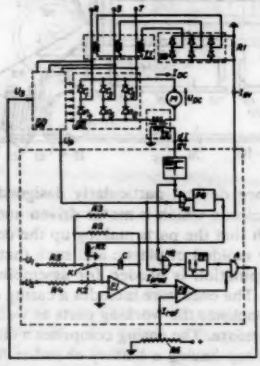
In a direct current arc welder comprising a phase control circuit for controlling the triggering phase of at least one controlled rectifier element to convert alternating current into direct current which is in turn supplied to a welding electrode and a workpiece to be welded and a feedback circuit for negative-feeding a portion of the direct current thus converted back to the phase control circuit thereby to control the welder output, a gain compensating circuit for compensating the gain of a control circuit in response to the value of said direct current output of the welder to maintain said gain at a substantially constant value no matter what level the value of said direct current output may be.

3,746,966

CURRENT CONVERTER CONTROL SYSTEM

Vilmos Torok, and Hans O. Skoog, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 20, 1972, Ser. No. 219,394
Claims priority, application Sweden, Feb. 2, 1971, 1227/71
Int. Cl. H02m 1/08
U.S. Cl. 321—5 16 Claims



Disclosed herein is a current control system for a static converter. The converter has an inductive load object connected to its DC terminals and has a plurality of controllable rectifiers with a firing pulse generator connected to the rectifiers for supplying firing pulses thereto in a predetermined commutation sequence. The control system has a current sensing device for sensing the DC load current of the converter. A function generator computes, on the basis of this current, during each interval between consecutive firing pulses, a predicted load current value. This predicted value at each moment during one of said intervals corresponds to the load current, which is obtained during the next one of said intervals, if the next firing pulse in the commutation sequence is supplied at that moment. The predicted value is compared with a current reference value. When these two quantitites become equal the next firing pulse is supplied.

3,746,967

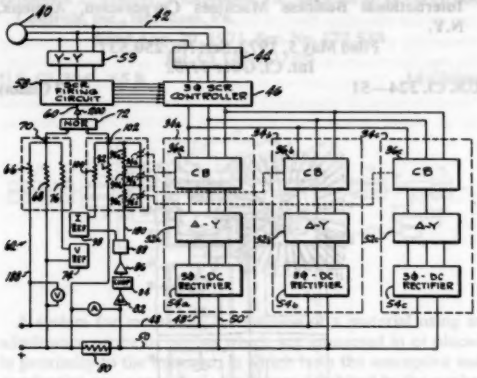
MODULAR POWER SUPPLY CIRCUIT

Michael A. Koltuniak, Warren, and James B. Rigney, Troy, both of Mich., assignors to Controlled Power Corporation, Farmington, Mich.

Continuation of Ser. No. 126,994, March 22, 1971, which is a continuation of Ser. No. 9,332, Feb. 6, 1970, abandoned. This application Mar. 13, 1972, Ser. No. 234,205
Int. Cl. H02m 7/00
U.S. Cl. 321—5 15 Claims

A modular supply for converting three-phase alternating current to direct current for high power applications. A plurality of individual rectifying modules are connected in parallel and fed by a common three-phase SCR controller. The rectified DC output of each of the individual modules are collected in parallel at common output busses. A self-adjusting voltage-current regulator is coupled to the output busses to sample the output current and voltage to control the power passed by the SCR controller. The voltage feedback and current feedback are applied to a "nor" gate which places the SCR controller under the control of the voltage feedback so long as the current does not exceed acceptable limits as determined by the number of modules active in the power supply and/or exceed a current limit that is set by the operator for the

power supply. In the voltage control mode, the output voltage is maintained substantially constant. The "nor" gate transfers control of the controller to a current limiting mode which maintains the current within acceptable limits while permitting the voltage to drop off. Each of the modules has an input circuit breaker associated therewith which in turn is arranged to vary the level of the current feedback depending on the number of active modules in the power supply.

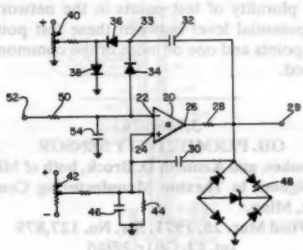


3,746,968

AMPLITUDE-TO-FREQUENCY CONVERTER

Robert A. Pease, Wilmington, Mass., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Sept. 8, 1972, Ser. No. 287,575
Int. Cl. H02m *5/00*; **321** *60;18*
U.S. Cl. 321—60 **9 Claims**



An amplitude-to-frequency converter is described which uses a single operational amplifier having both regenerative and degenerative feedback loops. The degenerative feedback loop includes a diode and capacitor in series, the inverting input of the amplifier is shunted to ground through an input capacitor. The output of the amplifier is connected to ground through a bilateral voltage limiting circuit. The amplifier will provide a rectangular wave output at a repetition rate linearly related to the amplitude of the input signal, the only precision values required being supplied by the voltage limiting circuit and the degenerative feedback capacitors.

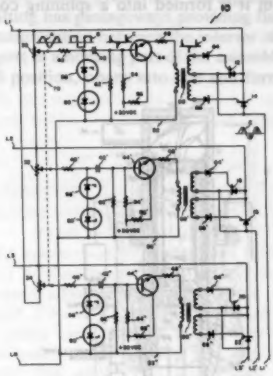
3,746,969

THREE-PHASE POWER CONTROL AND PHASE SHIFTER THEREFOR

Joseph Gessaroli, Danbury, Conn., and Stanley S. Brody, Tappan, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 3, 1972, Ser. No. 223,097
Int. Cl. G05f *5/00*
U.S. Cl. 323—22 SC **4 Claims**

A three phase electrical power control circuit wherein three, ganged potentiometers are utilized to provide selectively phase shifted signals which are squared, differentiated and coupled by emitter followers to transformers for driving the silicon controlled rectifiers through diodes to pass power current only during selected portions of power current cycles.

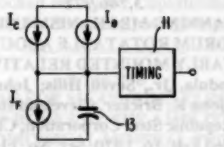


3,746,970

ROOT MEAN SQUARE VOLTAGE REGULATOR

George William Van Cleave, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,724
Int. Cl. G05f *1/44*
U.S. Cl. 323—22 SC **3 Claims**



A regulating power supply circuit in which the power supplied at the output is controlled by controlling the firing angle of a thyrister switching device in response to changes in a hybrid signal which is indicative of the difference between the RMS value of the output voltage and a desired RMS value. The hybrid signal is formed by summing a feedback current proportional to the absolute load voltage with a reference current proportional to the firing angle of the thyrister on a summing capacitor. Since for any given RMS voltage, the value of the average load voltage varies linearly with the conduction angle over a large range of conduction angles, the phase angle proportional reference current source is utilized to relate the absolute output voltage with the RMS voltage linearly over a wide range of input voltages.

3,746,971

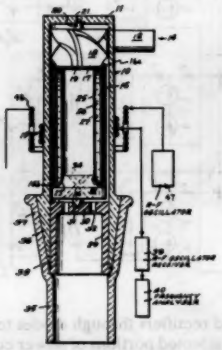
SAMPLE SPINNING CELL FOR NMR OF FLOWING SYSTEMS

William H. Storey, Jr., Houston, and Daniel A. Montalvo, San Antonio, both of Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 3, 1972, Ser. No. 240,618
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 R **5 Claims**

There is described a sample spinning cell for nuclear magnetic resonance of flowing systems consisting of a tubular housing provided with offset ports at its closed ends through which the sample liquid stream flows and impinges on the blades of a turbine assembly pivotally mounted in said housing

whereby the turbine rotates at a speed determined by the flow rate of the stream. The turbine blades which are integral with a hollow cylindrical housing direct the sample liquid into said housing wherein it is formed into a spinning column which



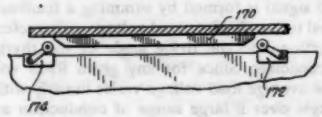
passes the nuclear magnetic resonance receiving coil mounted on the tubular housing and subsequently to a discharge port. Affixed in the hollow cylindrical housing is a sealed double wall cylindrical container containing a referencing solution and completely surrounding the spinning column.

3,746,972

BILLET SCANNING MECHANISM USING A PROBE CARRYING DRUM ROTATABLE ABOUT THE BILLET AND PIVOTABLY MOUNTED RELATIVE THERETO

Joseph M. Mandula, Jr., Seven Hills; John B. Fox, Shaker Heights, and John K. Bricker, Cleveland Heights, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Feb. 16, 1970, Ser. No. 11,467
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **12 Claims**



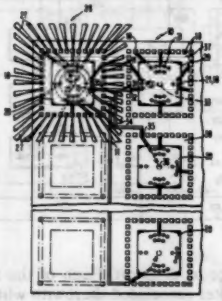
Method and apparatus for scanning a workpiece such as a billet. A rotating drum is utilized to mount one or more probe mechanisms to scan a workpiece that is passed through the drum. A frame assembly mounts the drum for rotation therein and is pivotally mounted. Guide rollers carried by the frame assembly bear against the workpiece and position the drum with respect to the workpiece. The frame assembly is also movable in a direction transverse to the pivotal axis of the frame assembly. The pivotal and transverse frame assembly movement permits the workpiece to be tracked. The rotating drum includes one or more self-contained fluid-acting mechanisms, such as a paint marking device and a pneumatic compressor. Only electrical connections pass between the relatively fixed frame assembly and the rotating drum. Fluid connections between these parts are not required simplifying the assembly.

3,746,973

TESTING OF METALLIZATION NETWORKS ON INSULATIVE SUBSTRATES SUPPORTING SEMICONDUCTOR CHIPS

Maurice T. McMahon, Jr., Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1972, Ser. No. 250,537
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **7 Claims**



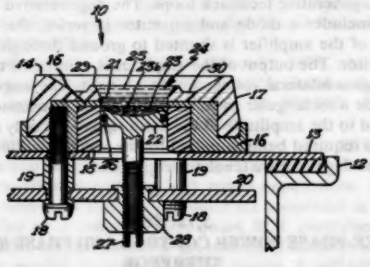
A method for testing the interconnector network on insulative substrates on which integrated circuit chips are to be mounted. The method involves testing for the operability of said interconnector network prior to the mounting of the chips by temporarily mounting at the chip sites a plurality of test chips. Each of these test chips contains a plurality of diodes which respectively connect the chip terminals to a common terminal. The chip terminals are connected to the interconnector network and the common terminal is externally accessible through the substrate. Potential levels are selectively applied to a plurality of test points in the network and differences in potential level between these test points and/or between the points and one or more of the common terminals are determined.

3,746,974

OIL PERMITTIVITY SENSOR

Donald S. Stoakes, and Kenneth D. Brock, both of Minneapolis, Minn., assignors to Thexton Manufacturing Company, St. Louis Park, Minn.

Filed Mar. 25, 1971, Ser. No. 127,879
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **3 Claims**



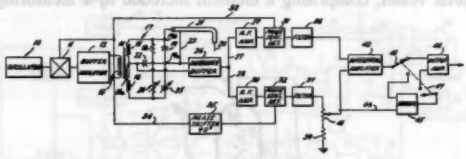
A sensor for determining permittivity of oil and the lubricating ability thereof including capacitor electrodes spaced from each other with the oil sample therebetween, the electrodes respectively having surfaces obliquely confronting each other and lying transverse to each other; the electrodes being respectively formed into the peripheral wall and bottom of an oil cup.

3,746,975

MEASURING CHARACTERISTICS OF MATERIALS BY USING SUSCEPTIVE AND CONDUCTIVE COMPONENTS OF ADMITTANCE

Frederick L. Maltby, Jenkintown, Pa., assignor to Drexelbrook Controls, Inc., Horsham, Pa.

Filed Aug. 20, 1971, Ser. No. 173,538
Int. Cl. G01r 27/02
U.S. Cl. 324—65 R 14 Claims



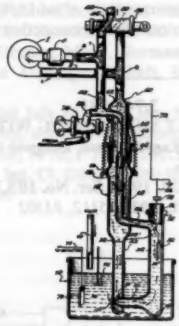
A system for measuring a condition of a material using an admittance probe or probes which are immersed in or placed in proximity to the material, in which both the susceptive and conductive components of admittance exhibited by the probes are utilized to provide measurements of the desired characteristic which are substantially free from errors due to variations in other characteristics of the materials.

3,746,976

SELF-CLEANING APERTURE TUBE FOR COULTER STUDY APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics Inc., Miami, Fla.

Filed Apr. 7, 1971, Ser. No. 131,923
Int. Cl. G01n 27/00
U.S. Cl. 324—71 CP 11 Claims



A two chamber aperture tube for obtaining signals from particles suspended in a fluid which passes through a scanning aperture. The suspension enters the primary bore provided in one chamber and passes immediately to an inlet port or orifice in an elongate nozzle provided in the second chamber. The chambers are interconnected by conduits including a pump and filter such that flow of the suspension is continuous about a closed path to ensure that proper signals from all particles in the suspension are obtained.

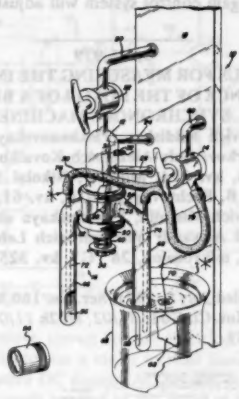
3,746,977

APERTURE TUBE ASSEMBLY FOR A PARTICLE STUDY APPARATUS

Walter R. Hogg, Miami Lakes, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 23, 1971, Ser. No. 173,988
Int. Cl. G01n 27/00
U.S. Cl. 324—71 CP 31 Claims

An assembly which includes a plurality of particle counting and sizing aperture tubes for use with a particle analyzer of the Coulter type. The assembly includes a rotatable, turret-like fitting having coupled thereto at their open-top end a plurality of the aperture tubes, preferrably having different aperture sizes. The fitting has passageways providing fluid and electric current communication between the interior of each aperture tube and a port in a housing part of the assembly. The housing is in a fixed position, opens into and can form a part of the fluid control piece of a typical Coulter type analyzer. The housing and fitting have fluid tight mating surfaces such that selective rotation of the fitting causes the port in the housing to be aligned with one of the passageways leading into any desired one of the aperture tubes, while the remaining aperture tubes are blocked off by the imperforate portion of the housing which seals the remaining passageways of the fitting.

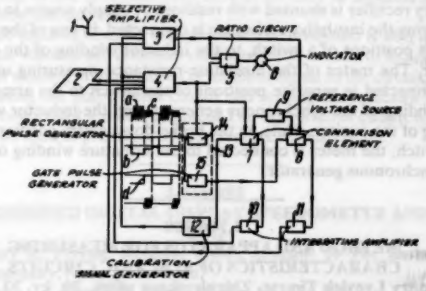


3,746,978

APPARATUS FOR MEASURING ELECTRICAL RESISTANCE OF ROCKS BY THE AMPLITUDE METHOD DURING GEOPHYSICAL MINERAL PROSPECTING

Boris Vasilievich Rogachev, ulitsa Sysoeva, 4, Reutov Moskovskoi Oblasti; Naum Abramovich Organovsky, ulitsa Gorkogo, 6, kv. 79, Zhukovsky Moskovskoi Oblasti; Ertel Sergeevich Sedelnikov, ulitsa, 39, korpus 2, kv. 18, and Mikhail Mikhailovich Charsky, 13, korpus 1, kv. 3, both of Moscow, all of U.S.S.R.

Filed Aug. 2, 1971, Ser. No. 168,085
Int. Cl. G01v 3/12
U.S. Cl. 324—6 2 Claims



A device for geophysical prospecting using radiotelegraph signals comprises a magnetic field strength sensor and an electric field strength sensor each connected to a selective amplifier. The amplifiers feed a meter measuring the ratio of their output amplitudes, which corresponds to a certain value of rock electric resistance. The device is provided with means for

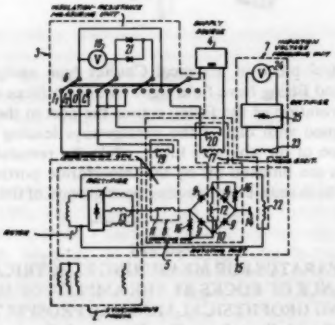
amplifier gain adjustment control in the form of an oscillator whose frequency is equal to that of the radio transmitting station used for prospecting. The oscillator signal passes through the amplifiers during spacing intervals between radiotelegraph signals of the transmitting station. The amplifiers output stages comprise elements for comparing the voltage of the amplified signal with that of a reference signal. A drift of the amplifier gain will change the output of the comparison elements and the automatic gain control system will adjust the gain of the amplifiers.

3,746,979

APPARATUS FOR MEASURING THE INSULATION RESISTANCE OF THE ROTOR OF A BRUSHLESS SYNCHRONOUS MACHINE

Vasily Semenovich Kildishev, Plekhanovskaya ulitsa, 41/43, kv. 55, Kharkov; Gely Alexeevich Kovalkov, Leningradsky prospekt, 26, kv. 174, Moscow; Nikolai Sergeevich Maznikin, ulitsa B. Pochtovaya, 14/16, kv. 61, Moscow; Alexandr Vasilievich Misjulin, Vyazemskaya ulitsa, 24, kv. 23, Moscow, and Alexandr Vladimirovich Lebedev, Konkovo-Derevlevo, 6, mikroraion, 26 "G", kv. 325, Moscow, all of U.S.S.R.

Filed July 8, 1971, Ser. No. 160,818
Int. Cl. G01r *31/02*; H02k *11/00*
U.S. Cl. 324—51 **4 Claims**



An apparatus is provided for measuring the insulation resistance of, and the voltage across, the rotor of a brushless synchronous machine. The apparatus is characterized in that the rotor of the synchronous machine is coupled to an insulation-resistance measuring unit via a synchronous generator with a rotary rectifier and an exciter, such that the field winding of the synchronous generator together with the rotary rectifier and the armature winding of the exciter are series-connected between the zero-potential datum point of the rotor of the synchronous machine and the rotor frame. The rotary rectifier is shunted with resistors. A supply source in measuring the insulative resistance is connected, in one of the various positions of a switch, to the inductor winding of the exciter. The meter of the insulation-resistance measuring unit is connected in separate positions of the switch to the armature winding of the synchronous generator and the inductor winding of the exciter, while, in the brake-down alarm position of a switch, the meter is connected to the armature winding of the synchronous generator.

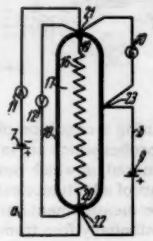
3,746,980

METHOD AND APPARATUS FOR MEASURING CHARACTERISTICS OF ELECTRIC CIRCUITS

Dmitry Lvovich Timrot, Zhigulevskaya ulitsa, 30, kv. 32, and Viktor Vladimirovich Makhrov, Saratovskaya ulitsa, 14/1, kv. 264, both of Moscow, U.S.S.R.

Filed Aug. 16, 1971, Ser. No. 172,082
Int. Cl. G01r *27/02*
U.S. Cl. 324—65 R **5 Claims**

Method and apparatus for measuring characteristics of an electric circuit. The method comprises the steps of connecting an adjustable voltage source to the opposite end terminals of a shunted portion of said electric circuit; connecting an additional adjustable voltage source to one part of the shunting circuit; operating said voltage sources to create such voltage drops across said shunted portion circuit and across said one part of the shunting, that no electric current flows through the remaining part of said shunting circuit; and then measuring the electric characteristics of said shunted portion of said electric circuit. The apparatus is useful for measuring the thermal characteristics of aggressive fluids contained within a closed metal vessel, comprising a element included in a measuring



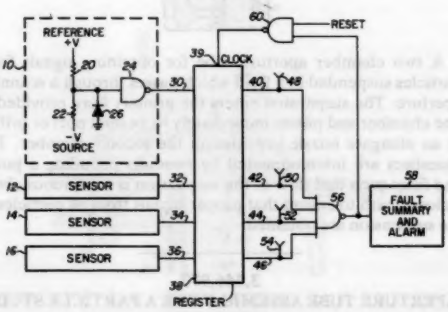
circuit, wherein the leads of said element are electrically connected to the internal surface of said vessel, said measuring circuit being connected to the external surface of said vessel at points located, respectively, adjacent to the points of connection of said leads of said element, there being connected intermediate of one of said points of the connection of said circuit and an arbitrary point on said external surface a compensating circuit including an adjustable voltage source, and a galvanometer connected intermediate of said arbitrary point and the other one of said points of the connection of said measuring circuit.

3,746,981

ELECTRICAL FAULT MONITORING WITH MEMORY

James S. Stone, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Sept. 24, 1971, Ser. No. 183,387
Int. Cl. G01r *15/12, 31/02*
U.S. Cl. 324—73 R **6 Claims**



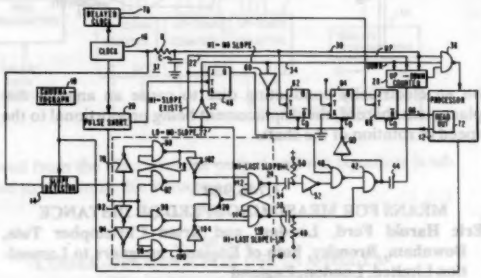
Means for monitoring electronic equipment and detecting faults including memory means whereby transient or intermittent faults may be identified and corrected after an interval of time.

3,746,982

APPARATUS FOR INDICATING THAT A CHROMATOGRAPHIC SIGNAL HAS ENDED

Robert W. Allington, and Herbert C. Griess, both of Lincoln, Nebr., assignors to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Nov. 17, 1970, Ser. No. 90,247
Int. Cl. G01r 23/16, 27/02
U.S. Cl. 324—77 A 17 Claims



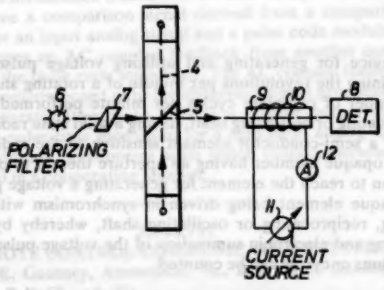
For compensation of a chromatographic signal, a circuit first indicates the existence of a baseline. This is done by issuing a pulse when a counter indicates that the time during which the signal exhibits no slope has equalled the total time of positive and negative slopes since the start of a chromatographic peak. When a circuit detects that the peak's apex is sharp, the counter is reset so that the counted no-slope time must equal only the slope time after the apex. Short noise peaks are inhibited by supressing readout when a positive slope or a negative slope lasts less than a given time period.

3,746,983

APPARATUS FUR MEASURING VERY HIGH CURRENTS PARTICULARLY DIRECT CURRENTS

Robert Renz, Kirchen, Murr, Germany, assignor to Transformation Union Aktiengesellschaft, Stuttgart-Bad Cannstatt, Germany

Filed July 20, 1971, Ser. No. 164,274
Claims priority, application Germany, July 20, 1970, P 20 35 923.3; July 20, 1970, P 70 27 259.2
Int. Cl. G01r 31/00; G01f 1/22
U.S. Cl. 324—96 9 Claims



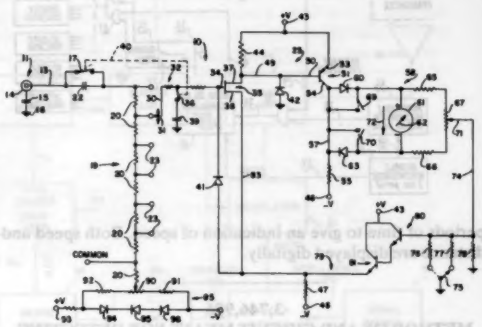
An apparatus for measuring very high currents, and in particular direct currents, wherein a body of material exhibiting the Faraday effect, e.g., flintglass, is disposed in the magnetic field caused by the current flowing in a conductor. A polarized light beam is passed through this body of material and the displacement of the polarization plane of the light beam is measured as a measure of the current flowing in the conductor. Preferably the body of material exhibiting the Faraday effect forms a closed path around the current conductor which path is followed by the light beam.

3,746,984

AUTOPOLARITY VOLTMETER CIRCUIT

Walter J. Cerveny, Lima, Ohio, assignor to Triplett Corporation, Bluffton, Ohio

Filed Sept. 8, 1970, Ser. No. 70,369
Int. Cl. G01r 15/08, 19/14
U.S. Cl. 324—115 19 Claims



A highly-sensitive circuit for an electrical instrument for causing the indicator on a meter to read linearly upscale for positive or negative DC signals, AC signals, or a combination of AC or DC signals applied to the input of the circuit. The input signal to be measured is provided to an input circuit which includes a resistive divider network in circuit with a null control circuit for selecting the range of input signals. A selected proportion of the input signal is applied to the input of a field effect transistor (FET). The output from the FET is applied to the input of a transistor having its output in circuit with a bridge network. The bridge network includes a pair of oppositely poled diodes in circuit with fixed resistors so that a first diode conducts for positive signals and a second diode conducts for negative signals from the transistor. A meter is connected in circuit with the diodes and is arranged so that the indicator on a meter reads upscale whether the output of the amplifier comprises positive or negative DC signals or AC signals or a combination of both. A feedback circuit includes a resistive network in circuit with the bridge for selecting the appropriate circuit sensitivity for the function to be performed by the circuit. The output from the resistive network in the feedback path is connected to a pair of transistors connected in a Darlington configuration, the output of which is connected to the FET. The input circuit also includes a switching circuit for providing a coupling capacitor in series circuit with the input signals to block DC when AC signals are being measured, and to provide a low pass filter in circuit with the input signals when DC signals are being measured. The circuit according to the invention may be also be used to measure resistance and current.

The method of using the circuit of the invention is also disclosed wherein the indicator on the meter is caused to indicate a null reading in the absence of an input signal to the circuit by adjusting the null control circuit and sensing the indicator on the meter until a null is reached. The null control circuit may also be used to provide a storage feature for the circuit.

3,746,985

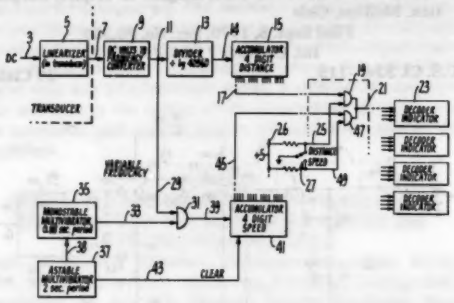
COMBINED DIGITAL DISPLAY SPEEDOMETER AND LOG

Robert R. Perron, Beverly, Mass., assignor to The Eastern Company, Naugatuck, Conn.

Filed Aug. 25, 1971, Ser. No. 174,777
Int. Cl. G01p 3/48
U.S. Cl. 324—166 2 Claims

A combined log and speedometer having a digital readout is provided wherein an electronic speed sensor actuates a voltage controlled oscillator so that the frequency of the oscillator is proportional to speed. The output pulses are counted and

accumulated to give an indication of the distance traveled and simultaneously the output pulses are sampled for precise



periods of time to give an indication of speed. Both speed and distance are displayed digitally.

3,746,986

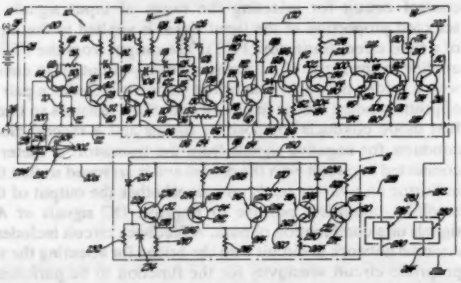
METHOD OF AND CIRCUIT MEANS FOR DETECTING AND RESPONDING TO RATE OF CHANGE OF SPEED

Michael F. Clemochowski, Warren, Mich., assignor to Holley Carburetor Company, Warren, Mich.

Filed Aug. 30, 1971, Ser. No. 175,862

Int. Cl. G01r *23/02*; G01p *3/42*

U.S. Cl. 324—162 **19 Claims**



A method of sensing and creating an output to the rate of change of speed includes creating an electrical pulse in timed relationship to the parameter of speed, amplifying the pulse and electrically shaping it to approach a more nearly squared configuration, using the shaped pulse to cyclically switch related switching means to and from a conductive state in order to develop a related saw-tooth like output voltage, electrically averaging the output voltage and employing same for an indication of the then value of speed, applying the output voltage to two electrically responsive sensing means, and preventing one of the sensing means from responding to the output voltage whenever a change in the parameter of speed occurs while permitting the other sensing means to respond thereby creating a triggering voltage to control the action of an output switch in that the output switch becomes responsive to such a condition of change of speed.

3,746,987

DEVICE FOR MEASURING THE SPEED OF A ROTATING SHAFT

Eric Harold Ford, London, W. 8, England, assignor to Lumenition Limited, London, England

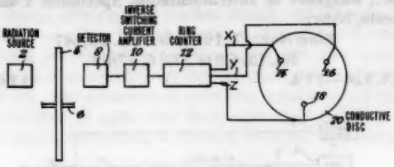
Filed Nov. 15, 1971, Ser. No. 198,521

Claims priority, application Great Britain, Nov. 20, 1970, 55,405/70

Int. Cl. G01p *3/48*

U.S. Cl. 324—167 **3 Claims**

A device for measuring the angular speed of rotation of a shaft in which a voltage pulse is obtained by chopping a source of infra-red radiation in synchronism with the rotation of the shaft, amplifying, fast switching and dividing the voltage pulses thus obtained so as to generate a rotating field which acts



on an electrically conducting disc to cause an angular displacement thereof, the displacement being proportional to the speed of rotation of the shaft.

3,746,988

MEANS FOR MEASURING SPEED OR DISTANCE

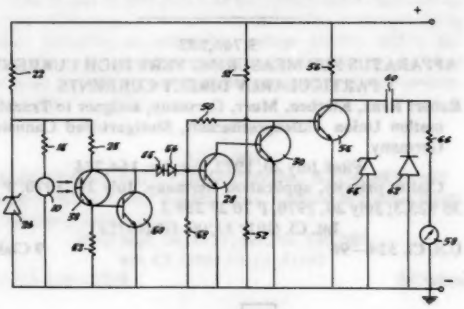
Eric Harold Ford, London, and Brian Christopher Tate, Downham, Bromley, both of England, assignors to Lumenition Limited, London, England

Continuation-in-part of Ser. No. 864,230, Feb. 26, 1969, abandoned. This application Jan. 5, 1971, Ser. No. 104,070

Claims priority, application Great Britain, Feb. 29, 1968, 9,945/68; France, Feb. 28, 1969, 6905420; Germany, Feb. 27, 1969, P 19 09 886.3; Italy, Feb. 26, 1969, 858457 A/69; Japan, Feb. 28, 1969, 45/15258; Sweden, Feb. 26, 1969, 2644/69; Canada, Feb. 28, 1969, 044239; Austria, Feb. 28, 1969, 51256

Int. Cl. G01p *3/48*

U.S. Cl. 324—175 **14 Claims**



A device for generating and utilizing voltage pulses for determining the revolutions per minute of a rotating shaft or the number of complete cycles per minute performed by a reciprocating or oscillating shaft, having a solid state radiation source, a semi-conductor element sensitive to the radiation and an opaque member having an aperture therein to permit radiation to reach the element for generating a voltage pulse, the opaque element being driven in synchromism with the rotating, reciprocating or oscillating shaft, whereby by fast switching and electronic summation of the voltage pulses the revolutions or cycles can be counted.

3,746,989

ADAPTIVE EQUALIZER FOR DIGITAL INFORMATION

David E. Heim, Urbana, Ill., assignor to The Magnavox Company, Fort Wayne, Ind.

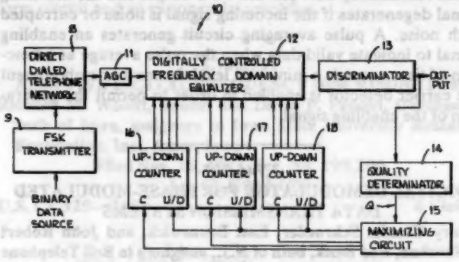
Filed Sept. 30, 1971, Ser. No. 185,211

Int. Cl. H04b *1/10*

U.S. Cl. 325—42 **11 Claims**

An adaptive equalizer is disclosed which can be used to equalize digital information sent over the switched telephone network. Frequency shift keyed signals pass through an elec-

tronically controllable frequency domain equalizer to a discriminator. A voltage proportional to transmission quality is



derived from the discriminator output and the equalizer is adjusted to maximize this voltage.

3,746,990

CODER-DECODER FOR USE IN A DELTA-TRANSMISSION SYSTEM

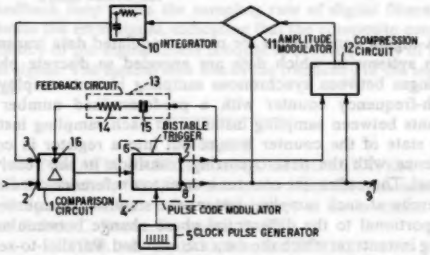
Michel Alain Rene Le Diberder, 19 Gif S/Yvette; Gilbert Marie Marcel Ferrieu, Bievres, and Roger Bernard Jules Hamel, Clichy, all of France, assignors to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Mar. 19, 1971, Ser. No. 126,151

Claims priority, application France, Mar. 25, 1970, 7010766

Int. Cl. H03k *13/22*

U.S. Cl. 325—38 B **10 Claims**



A delta modulation transmitter includes comparator means to produce a comparison signal derived from a comparison circuit for an input analog signal and a pulse code modulator and features an AC coupled feedback from another output signal of the pulse code modulator. The AC coupled feedback signal is superimposed onto the difference signal produced by the comparator thereby to provide a reliable output signal from the pulse code modulator for a zero input analog signal and in addition, to suppress noise which would otherwise be produced in a cooperating receiver.

3,746,991

REMOTE CONTROL COMMUNICATIONS SYSTEM

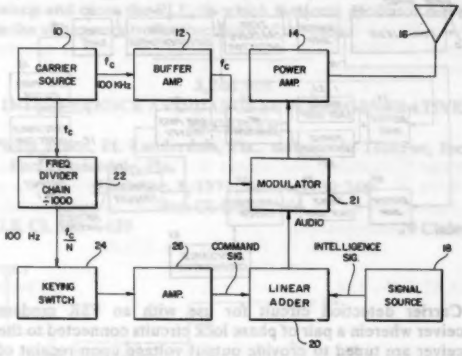
George E. Gautney, Annandale, Va., assignor to Gautney & Jones, Falls Church, Va.

Filed July 15, 1970, Ser. No. 55,101

Int. Cl. H04b *7/00*

U.S. Cl. 325—55 **16 Claims**

A transmitter, which remotely controls the demuting of a normally muted radio receiver, derives a command signal from a carrier wave, the command signal having a frequency or a duration which is precisely related to the frequency of the carrier wave. The receiver derives a reference signal from the received carrier wave, having a frequency which is a predetermined fraction of the frequency of the carrier wave, detects the command signal, and compares a time parameter of the command signal (either its frequency or duration) with the frequency of the reference signal. If a predetermined relationship exists, a control signal is provided for controlling a muting/demuting circuit in the receiver. Selective addressing of a particular receiver may be effected by providing the transmitter with means for deriving a plurality of command signals, each having a different time parameter corresponding to a particular receiver, and selective keying means for selecting one of the command signals for transmission. The carrier wave may be a pilot carrier which, in turn, modulates a main carrier wave of the transmitter.



3,746,992

MAGNETIC PLATE FOR DRAWING DESK LINING

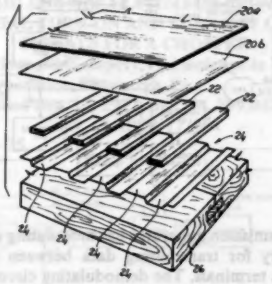
Ezio Serembe, 3 Viale Corsica, Milano, Italy

Filed Sept. 15, 1971, Ser. No. 180,655

Claims priority, application Italy, Sept. 16, 1970, 29793 A/70

Int. Cl. H01f *7/20*

U.S. Cl. 335—285 **8 Claims**

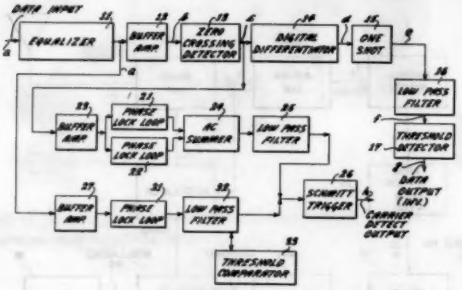


A composite laminate planar structure including an upper layer of non-magnetic material and adapted to form the work surface of a drawing table, and a lower layer including a plurality of evenly arranged and elongated permanent magnets seated into corrugations of a corrugated sheet of high magnetical permeability to provide on said surface a plurality of spots of opposite polarity and capable of magnetically attracting ferrous strips superimposed to drawing paper sheet laid on and thus secured to said work surface.

3,746,993
CARRIER DETECTION CIRCUIT

Mushtaq Ahmed, and Sydney Glazer, both of San Diego, Calif., assignors to The National Cash Register Company, Dayton, Ohio

Filed Dec. 27, 1971, Ser. No. 212,426
Int. Cl. H04b 7/16
U.S. Cl. 325—320 11 Claims

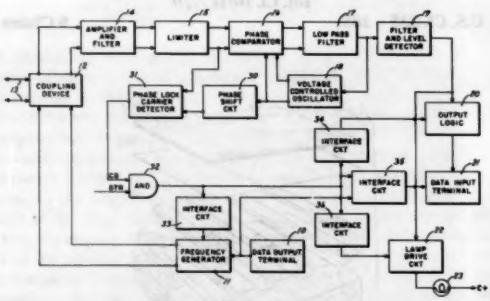


Carrier detection circuit for use with an FSK modem receiver wherein a pair of phase lock circuits connected to the receiver are tuned to provide output voltage upon receipt of either a mark or space signal, and a third phase lock circuit connected to the receiver is tuned to provide an output voltage upon receipt of a mark signal. These voltages are applied to a Schmitt trigger to provide a carrier detect output voltage to digital utilization equipment.

3,746,994
APPARATUS FOR DETERMINING THE VALIDITY OF DATA RECEIVED BY DATA

Melvin G. Kramer, Riverton, Wyo., assignor to Datel Corporation, McLean, Va.

Filed Mar. 11, 1971, Ser. No. 123,308
Int. Cl. H04b 1/16
U.S. Cl. 325—320 8 Claims

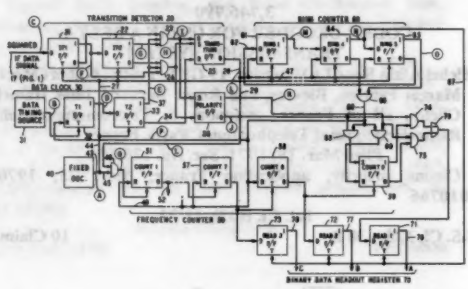


A data transmission apparatus has modulating and demodulating circuitry for transmitting data between transmission lines and data terminals. The demodulating circuitry includes a phase lock discriminator loop which converts logic signals of first and second discrete frequencies into DC logic signals. The phase lock discriminator loop includes a voltage controlled oscillator (VCO) and is operable to lock on and track a single frequency signal. The VCO is operable when the loop is locked on to an incoming frequency, such as one or the other of the logic signals at discrete frequencies, to generate an output at the incoming frequency with a phase displacement of 90°. A phase shift circuit receives the VCO output and phase shifts the output 90° into phase with the incoming discrete frequency. A carrier detector senses the electrical signals transmitted to the discriminator loop and ANDS the phase shifted VCO output with the electrical signals transmitted to the discriminator loop. Thereby, pulses are generated which are a measure of the validity of received data since the 90° phase relationship between the VCO output and the incoming signal degenerates if the incoming signal is noise or currupted with noise. A pulse averaging circuit generates an enabling signal to indicate valid data when the pulse average as a function of time exceeds a minimum level. In another embodiment the carrier detector is enabled in order to permit the generation of the enabling signal.

3,746,995
DIGITAL DEMODULATOR FOR PHASE-MODULATED DATA TRANSMISSION SYSTEMS

Henry Charles Schroeder, East Brunswick, and John Robert Sheehan, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 17, 1971, Ser. No. 199,694
Int. Cl. H04l 27/22; H03d 3/04
U.S. Cl. 325—320 8 Claims

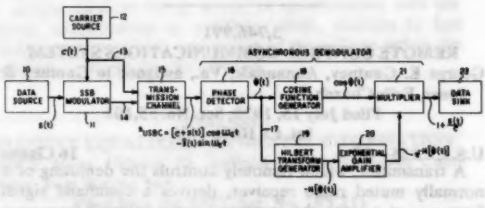


A digital demodulator for phase-modulated data transmission systems in which data are encoded as discrete phase changes between synchronous sampling instants employs a high-frequency counter with a predetermined number of counts between sampling instants. At each sampling instant the state of the counter is read out into a register in coincidence with the next occurring transition in the received signal. Thereafter, the counter is reset to a reference condition whereby at each sampling instant the state of the counter is proportional to the differential phase change between sampling instants on which the data are encoded. Parallel-to-serial conversion of the most significant counter states restores the transmitted data.

3,746,996
ASYNCHRONOUS SINGLE-SIDEBAND DEMODULATION

John Terrance Peoples, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1971, Ser. No. 213,595
Int. Cl. H03d 1/24
U.S. Cl. 325—330 8 Claims



Asynchronous or noncoherent demodulation, i.e., demodulation without employing a carrier wave at the receiver to multiply the incoming channel signal, of single-sideband signals is accomplished using only the instantaneous phase deviation in-

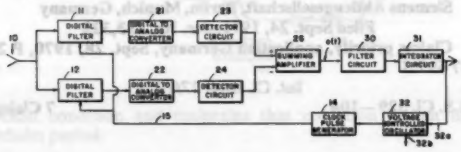
formation of the channel signal. The required receiver comprises an instantaneous phase deviation detector followed by a nonlinear, post-detection processor including a cosine generator in parallel with the tandem combination of a Hilbert transform circuit and an exponential amplifier.

3,746,997

ADAPTIVE DIGITAL FREQUENCY DISCRIMINATOR

Richard M. Willett, Boone, and David P. Passeri, Davenport, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 16, 1971, Ser. No. 199,200
Int. Cl. H03d 3/02
U.S. Cl. 325—349 6 Claims



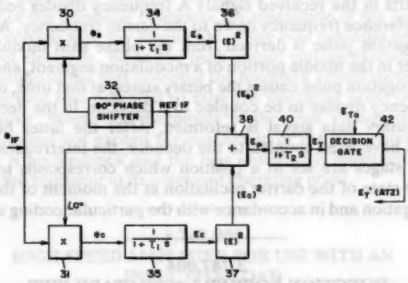
First and second digital filters having similar transfer characteristics are arranged to have their center frequency tuned to either side of a composite center frequency so that their characteristics are symmetrical relative to that composite center frequency. The digital filters receive a common input signal known to vary slightly in frequency; and each filter generates an output signal representative of the component of the input signal within its bandwidth. The output signals of the filters are detected and one is subtracted from the other to generate an error signal which is representative of the difference between the frequency component of the input signal and the composite center frequency of the digital filters. A feedback loop varies the sampling rate of digital filters to minimize the error signal, indicating that the composite center frequency of the digital filters is equal to the frequency of the input signal. The system thus tracks the frequency of the input signal.

3,746,998

AUTOMATIC CARRIER ACQUISITION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert C. Bunce, Pasadena, Calif.

Filed Dec. 13, 1971, Ser. No. 207,211
Int. Cl. H04b 1/26
U.S. Cl. 325—420 11 Claims



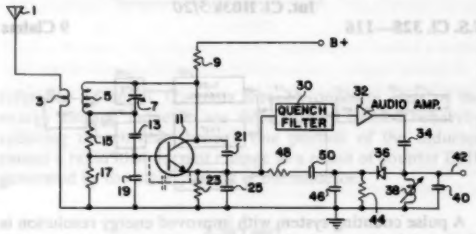
An automatic carrier acquisition system for a phase-locked loop (PLL) receiver is disclosed. It includes a local oscillator, which sweeps the receiver to tune across the carrier frequency uncertainty range until the carrier crosses the receiver IF reference. Such crossing is detected by an automatic acquisition detector. It receives the IF signal from the receiver as well as the IF reference. It includes a pair of multipliers which multiply the IF signal with the IF reference in phase and in quadrature. The outputs of the multipliers are filtered through bandpass filters and power detected. The output of the power detector has a signal DC component which is optimized with respect to the noise DC level by the selection of the time constants of the filters as a function of the sweep rate of the local oscillator. The power detector output passes through another filter, whose time constant is chosen to optimize the peak of a pulse produced around zero beat with respect to the root-mean-square (RMS) of the noise variations. When the amplitude of this pulse is not less than a selected amplitude, an acquisition trigger at zero beat pulse is produced to stop the sweep and close the PLL, in which the local oscillator serves as the voltage controlled oscillator of the loop.

3,746,999

INTERFERENCE AVOIDANCE SUPERREGENERATIVE RECEIVER

Philip Freen, Ft. Lauderdale, Fla., assignor to Teletron, Inc., Fort Lauderdale, Fla.

Filed Apr. 1, 1971, Ser. No. 130,246
Int. Cl. H04b 1/16
U.S. Cl. 325—429 19 Claims



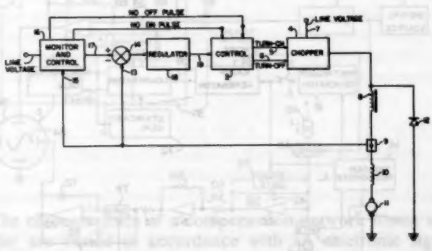
The audio output of an essentially conventional superregenerative receiver is rectified and connected back through a resistor to the capacitor of the quench oscillation circuit and to ground across a capacitor and resistor in parallel. This arrangement causes the quench frequency to vary with the detection of audio modulation, and the shift of local quench frequency avoids sustained detection of the incorrect signal. The interference signal may be the quench frequency of a nearby receiver. A capacitor is situated in the feedback circuit to prevent a shift of two receivers to the same, stable condition.

3,747,000

METHOD AND APPARATUS FOR PROVIDING SEQUENTIAL TURN-ON AND TURN-OFF CONTROL SIGNALS FOR A CHOPPER

Donald A. McIver, McKeesport, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1971, Ser. No. 209,052
Int. Cl. H03k 17/00
U.S. Cl. 328—75 14 Claims



A counter counts in response to provided timing signals, and a first plurality of gates respond to a first predetermined count for providing a turn-on signal for the chopper. A second plurality of gates respond to a second predetermined count to

provide a signal manifestation indicative of the time interval during which the turn-off signal for the chopper may be provided. A comparator compares a status signal, indicative of the desired signal level of operation of the chopper, with a ramp wave. When the signal level of the ramp wave is substantially at the same signal level as the status signal a control signal is generated. The latter control signal is provided to the input of a shift register and in response to the timing signals, the control signal is shifted through the shift register. When the shift register stores a selected signal indication, the turn-off pulse for the chopper is provided. There are also included means for inhibiting the provision of the turn-on and turn-off signals in the event the chopper is not operating at selected performance levels.

3,747,001

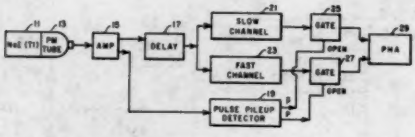
PULSE PROCESSING SYSTEM

George E. Fasching, and George H. Patton, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 17, 1972, Ser. No. 227,172

Int. Cl. H03k 5/20

U.S. Cl. 328—116 **9 Claims**



A pulse counting system with improved energy resolution is disclosed having dual channels for pulse processing at different rates and a pulse pileup detector to select which channel is utilized. Pulse input is delayed until the pileup detector can determine if any pulse is so closely followed in time by a second pulse to constitute pulse pileup. If no pulse pileup is detected, the slower channel is selected. The slow channel clips the pulse to a relatively wide pulse width to retain good energy resolution. If pulse pileup is predicted, the fast channel with correspondingly shorter pulse width is selected to improve resolution in respect to time. The output of the two channels are transmitted to a pulse height analyzer for interpretation.

3,747,002

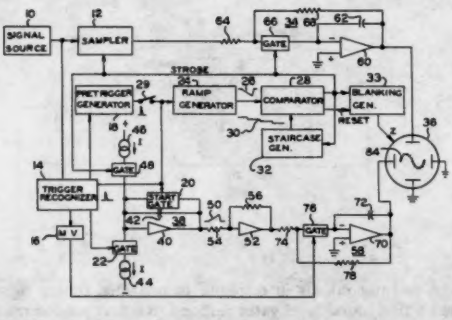
TIME AND SEQUENCE DETERMINING CIRCUIT

George J. Frye, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 827,824, May 26, 1969, Pat. No. 3,611,003. This application Apr. 29, 1971, Ser. No. 138,782

Int. Cl. H03j 17/00

U.S. Cl. 328—128 **2 Claims**



Horizontal deflection in a sampling oscilloscope is accurately determined by measuring the time difference between the occurrence of a triggering signal and the occurrence of a strobe or sample-producing signal. For measuring this time difference, a net charge of a first is accumulated in response to a first sequence polarity these signals, the value of the charge accurately indicating such time difference. If the signal sequence is reversed, a charge of a second polarity is accumulated with the value of the charge again being an accurate measure of the time difference. The charge value controls the magnitude of the oscilloscope's horizontal deflection, and the charge polarity controls the deflecting direction.

3,747,003

CIRCUITRY FOR DEMODULATION OF PHASE DIFFERENCE MODULATED DATA SIGNALS

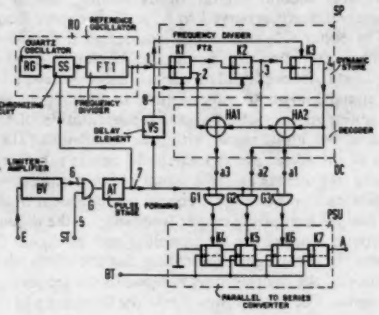
Joachim Siglow, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Sept. 24, 1971, Ser. No. 183,322

Claims priority, application Germany, Sept. 28, 1970, P 20 47 697.5

Int. Cl. H04l 27/22

U.S. Cl. 329—104 **7 Claims**



A circuit is described for demodulating phase difference modulated data signals wherein data, in binary coded form, is transmitted by modulating a carrier with specific phase shifts, the magnitude of each phase shift corresponding with a predetermined data signal level or levels. The demodulator includes a reference oscillator which emits a frequency with *n*-valued phase difference modulation which has n times the value of the carrier frequency. (n being the expected number of shifts in the received signal) A frequency divider reduces the reference frequency down to the carrier frequency. An interrogation pulse is derived from the phase shift modulated carrier in the middle portion of a modulation segment, and the interrogation pulse causes the binary states, at that time, of the frequency divider to be coupled to a decoder. In the decoder the binary data signal is reformed. After the latter binary states have been coupled to the decoder, the interrogated divider stages are set to a position which corresponds to the phase state of the carrier oscillation at the moment of the interrogation and in accordance with the particular coding used.

3,747,004

INJECTION-LOCKED LASER STABILIZER

Michael W. Sasnett, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

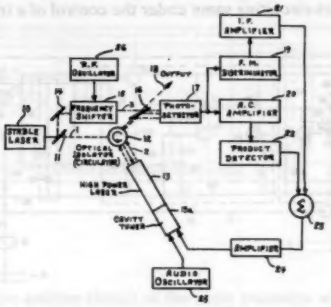
Filed May 14, 1971, Ser. No. 143,368

Int. Cl. H01s 3/02

U.S. Cl. 330—4.3 **3 Claims**

An injection-locked laser stabilizer is provided utilizing an injection-locked laser system comprising a small stable laser, an optical frequency isolator (circulator) and a high power

laser which is injection-locked by the small stable laser. The stabilizer provides an automatic acquisition of the injection-



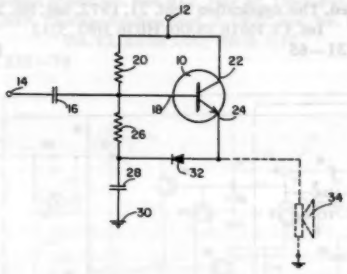
locked condition and maintains that condition for an indefinite period.

3,747,005

AUTOMATIC BIASED CONTROLLED AMPLIFIER

Ronald J. Freimark, Addison, and Ole K. Nilssen, Barrington Hills, both of Ill., assignors to Motorola, Inc., Franklin, Ill.

Filed Feb. 1, 1971, Ser. No. 111,455
Int. Cl. H03f 3/04
U.S. Cl. 330—22 **5 Claims**



An audio power amplifier comprising a transistor operated as an emitter follower which is quiescently biased so that the DC current through the output speaker is small. A feedback circuit connected between the output and the control electrode of the transistor compares the magnitude of the output peak voltage with the magnitude of the bias potential on the control electrode. When the peak output voltage exceeds the magnitude of the bias potential the feedback circuit increases the control bias potential to raise the operating point of the transistor. Where the magnitude of the peak voltage of the output does not exceed the magnitude of the bias potential, there is no-feedback and the bias potential is maintained to keep the transistor at its quiescent operating point.

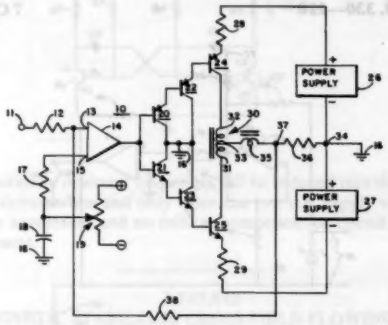
3,747,006

HIGH SPEED AMPLIFIER FOR USE WITH AN INDUCTIVE LOAD

John C. Freeborn, West Covina, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 48,798, June 8, 1970, Pat. No. 3,638,150, which is a continuation of Ser. No. 707,274, Feb. 21, 1968, abandoned. This application Dec. 2, 1971, Ser. No. 204,219
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D **11 Claims**

Amplifier apparatus which employs a center tapped energy storage inductor for rapidly varying the magnitude and direction of current through an inductive load. The load is connected between a source of reference potential and the center tap on the inductor of which opposite ends are connected through current limiting means to power supply terminals at voltages respectively higher and lower than the



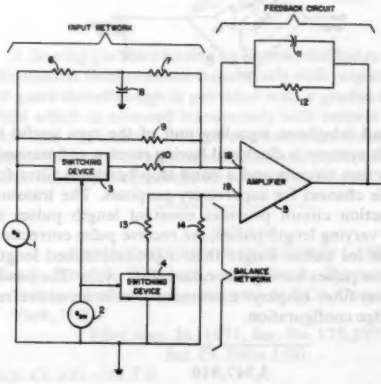
reference potential. Currents through opposite ends of the energy storage inductor are differentially limited, whereby reducing the current through one portion of the inductor causes a rapid load current change as a result of counter EMF generated by the other portion of the inductor.

3,747,007

VARIABLE COMPENSATION FOR FEEDBACK CONTROL SYSTEMS

Karl R. Geitner, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 7, 1972, Ser. No. 269,683
Int. Cl. H03f 1/36
U.S. Cl. 330—51 **3 Claims**



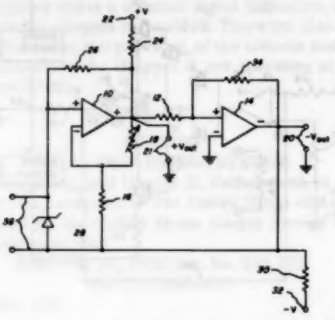
The characteristics of a compensation network for an amplifier are varied in accordance with an electronic signal representing critical system parameters. A resistive reactive "T" branch is paralleled by a switching device and resistor. The parametric signal activates the switching device and the networks are connected between the input signal and an input of the amplifier.

3,747,008

REFERENCE POWER SUPPLY HAVING AN OUTPUT VOLTAGE LESS THAN ITS CONTROL ELEMENT

Leo G. Zaretsky, San Diego, Calif., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 23, 1971, Ser. No. 211,499
Int. Cl. H03f 1/36
U.S. Cl. 330—110 7 Claims



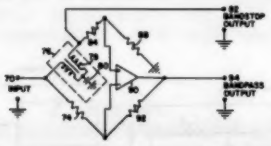
A power supply producing a bi-polar reference voltage uses a constant votage element, such as a zener diode, in a negative feedback loop from the reference voltage output of an amplifier to the input of another amplifier in a two amplifier system. This negative feedback loop permits the establishment of a reference voltage output lower in magnitude than the voltage of the constant voltage element.

3,747,009

TELEPHONE SIGNALING UNIT FILTER CIRCUIT

Klaus Ernst Funke, Novato, Calif., assignor to Digital Telephone Systems, Inc., San Rafael, Calif.

Division of Ser. No. 49,399, June 24, 1970, Pat. No. 3,637,443. This application Jan. 20, 1972, Ser. No. 219,585
Int. Cl. H03f 3/00
U.S. Cl. 330—146 2 Claims



An in-band telephone signaling unit of the type useful in carrier trunk systems is disclosed having receive and transmit pulse correction circuits and a band stop/bandpass filter for using an idle channel for supervisory purposes. The transmit pulse correction circuit provides constant length pulses in response to varying length pulses; the receive pulse correction circuit looks for pulses longer than a predetermined length and generates pulses having a constant duty cycle. The band-stop/bandpass filter employs a resonant arm in an active resistance bridge configuration.

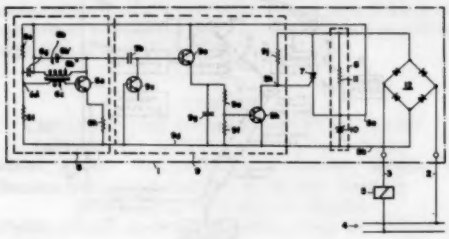
3,747,010

POWER SUPPLY FOR OSCILLATOR CIRCUIT OF CONTACTLESS PROXIMITY INDICATOR

Robert Buck, Torkelweg 47, 8990 Lindau-Enzisweiler, Germany

Continuation-in-part of Ser. No. 80,016, Oct. 12, 1970, abandoned. This application Sept. 21, 1972, Ser. No. 290,866
Int. Cl. H01h 36/00; H03b 5/12
U.S. Cl. 331—65 10 Claims

A contactless proximity sensor includes an oscillator which generates an output damped by the presence of a metal part whose approach is to be detected. The operating voltage for the oscillator is developed across a Zener diode which is connected in series with a high-ohmic resistance across a supply source, the resistance being shunted by an electronic switch short-circuiting same under the control of a trigger amplifier upon a critical reduction in the amplitude of the oscillator output. Closure of the electronic switch does not materially affect the operation of the oscillator but actuates a current-responsive indicator, such as a relay, in its two-wire energizing circuit.

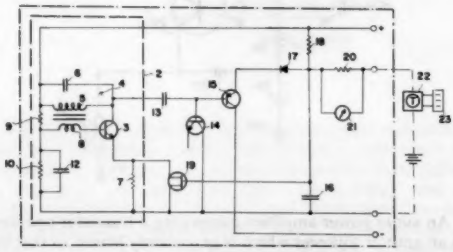


3,747,011

METAL DETECTOR INCLUDING PROXIMITY-RESPONSIVE OSCILLATOR WITH FEEDBACK-STABILIZED GAIN

Robert Buck, 47 Torkelweg, Lindau-Enzisweiler, Germany

Continuation-in-part of Ser. No. 80,017, Oct. 12, 1970, abandoned. This application Sept. 21, 1972, Ser. No. 290,867
Int. Cl. H01h 36/00; H03b 3/02, 5/12
U.S. Cl. 331—65 8 Claims



An electronic contactless distance indicator adapted to respond to the proximity of a metallic element has an oscillator including a main transistor with a rectified output degeneratively fed back to the input of that transistor to increase its amplification factor upon a reduction of the amplitude of the generated oscillations due to the approach of such element. The rectified voltage derived from this oscillation controls an ancillary transistor, specifically an F.E.T., in an emitter lead of the main transistor and is also fed to an indicator as a measure of the distance of the metallic element from the oscillator.

3,747,012

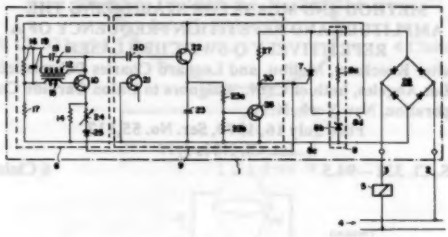
CONTACTLESS OSCILLATOR-TYPE PROXIMITY SENSOR WITH ADJUSTABLE HYSTERESIS

Robert Buck, Torkelweg 47, Lindau-Enzisweiler, Germany

Continuation-in-part of Ser. No. 79,741, Oct. 12, 1970, abandoned. This application Sept. 21, 1972, Ser. No. 290,868
Int. Cl. H01h 36/00; H03b 3/02, 5/12
U.S. Cl. 331—65 9 Claims

A proximity sensor including an oscillator, whose output amplitude varies with the approach of an extraneous metallic element, comprises a main transistor whose emitter resistance

is constituted in part by an ancillary transistor controlled by the rectified oscillator output to trigger a thyristor for changing the current flow through a load whenever the amplitude of the oscillations decreases to a critical level. Upon the firing of the thyristor, the ancillary transistor opens a resistive shunt



path in the emitter circuit of the main transistor where negative feedback is intensified; this reduces the loop gain of the oscillator whose response threshold is thus raised to provide a hysteresis or toggle effect which can be adjusted by means of a variable resistor also forming part of the emitter resistance of the main transistor.

3,747,013

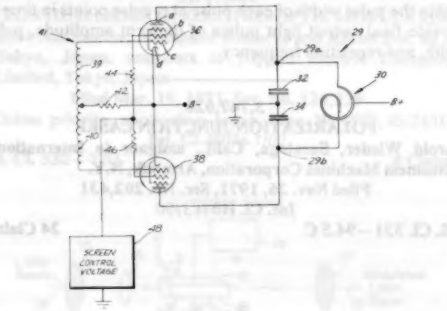
TUNED-PLATE TUNED-GRID SHORT WAVE SIGNAL GENERATOR WITH POWER OUTPUT CONTROLLED BY SCREEN GRID

Hal C. Mettler, Pasadena, Calif., assignor to Hal C. Mettler and Lovena Mettler, Anaheim, Calif.

Division of Ser. No. 846,012, July 30, 1969, Pat. No. 3,638,657. This application Sept. 2, 1971, Ser. No. 177,225

Int. Cl. A61n 5/00; H03b 5/10

U.S. Cl. 331—74 **4 Claims**



A signal generator having a vacuum tube in a tuned plate, tuned grid oscillator circuit. A coil is placed in the tuned plate circuit for providing short wave signals. The tube has at least a control grid connected to the tuned grid circuit and a screen grid. A circuit is coupled to the screen grid for enabling a signal to be fed back from the plate circuit through the screen grid to the control grid and comprises an impedance for coupling the screen grid to a source of control signals for controlling the power delivered by the coil.

3,747,014

FAIL-SAFE ELECTRONIC COMPARATOR CIRCUIT

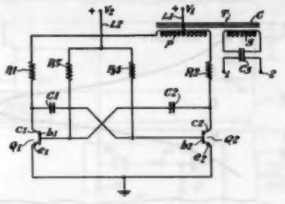
John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Mar. 15, 1971, Ser. No. 124,374

Int. Cl. H03k 3/282; H03b 3/08

U.S. Cl. 331—77 **8 Claims**

This disclosure relates to a fail-safe comparator circuit having a free-running multivibrator powered by two separate d.c. supply voltages. A resonant circuit is coupled to the output of the multivibrator and tuned to the normal resonant frequency of oscillation of the multivibrator so that oscillations having



the normally resonant frequency will be induced into the resonant circuit when and only when the two d.c. supply voltages are in agreement and no critical component or circuit failure is present.

3,747,015

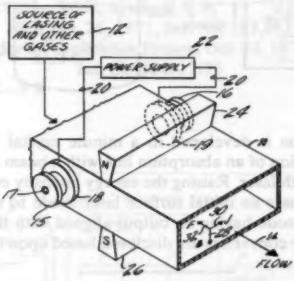
MAGNETIC STABILIZED CROSS FIELD FLOWING GAS LASER

Carl J. Buczek, Manchester, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 877,319, Nov. 17, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,685

Int. Cl. H01s 3/10

U.S. Cl. 331—94.5 **2 Claims**



A flowing gas laser having an electric discharge plasma with the electric field oriented transversely with respect to the flow of gases therethrough is provided with a graduated magnetic field which is oriented transversely with respect to both the flow and the electric field to overcome the forces of flowing gases thereon. The plasma stabilizes at a point where the magnetic field force equals the force of the gas flow.

3,747,016

SEMICONDUCTOR INJECTION LASER

Henry Kressel, Elizabeth, and Frank Zygmunt Hawrylo, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

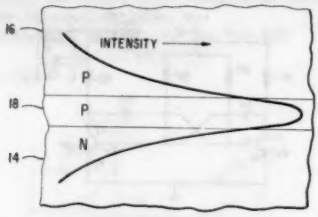
Filed Aug. 26, 1971, Ser. No. 175,197

Int. Cl. H01s 3/00

U.S. Cl. 331—94.5 H **8 Claims**

A semiconductor injection laser which emits a beam of radiation having improved beam divergence has a body of semiconductor material including a first region of one conductivity type, a second region of the opposite conductivity type and a third region of either conductivity type between the first and second regions and forming a PN junction with one of the first or second regions. The junctions between the third region and each of the first and second regions are heterojunctions which extend in substantially parallel relation to the edges of

the body. The third region is of a thickness of between 0.2 and 0.3 microns and has an index of refraction which is no greater than about 0.05 higher than the index of refraction of each of

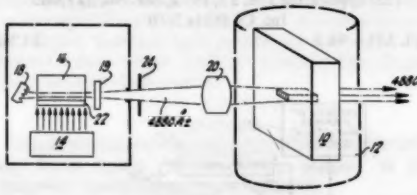


the first and second regions so as to permit some of the light generated in the third region to spread out into each of the first and second regions.

3,747,017
ENERGY CONVERTER, SURFACE LASER AND METHODS FOR THEIR OPERATION

Frank L. Varsanyi, 287 W. Ridge Drive, Portola Valley, Calif.

Filed June 3, 1971, Ser. No. 149,532
Int. Cl. H01s 3/06
U.S. Cl. 337—94.5 **7 Claims**

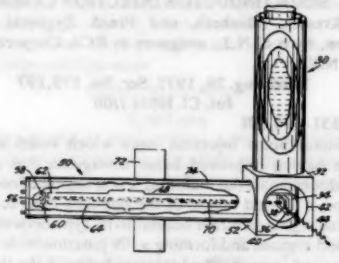


Laser action is developed in a minute crystal volume by direct excitation of an absorption line with a beam of a tuneable wavelength laser. Raising the energy intensity of the exciting beam causes an initial surface laser mode to shift into a penetration mode having an output aligned with the exciting beam. Energy converters are disclosed based upon the above.

3,747,018
PLATELET SEMICONDUCTIVE LASER

William C. Tait, Oak Park Heights; Donald A. Campbell; James R. Packard, both of St. Paul, and Gunther H. Dierssen, White Bear Lake, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 588,906, Oct. 24, 1966, abandoned.
This application Mar. 16, 1972, Ser. No. 124,949
Int. Cl. H01s 3/09, 3/06, 3/18
U.S. Cl. 331—94.5 **10 Claims**

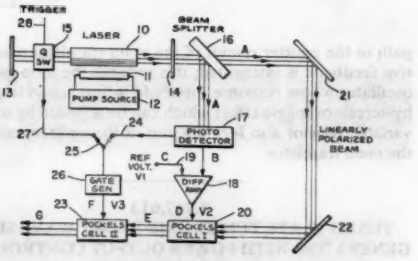


A laser device comprising a naturally grown single crystal semiconductor platelet having a power conversion efficiency of at least 10^{-2} percent and a means for producing and impinging upon the crystal a beam of electrons of energy less than 75 KeV.

3,747,019
METHOD AND MEANS FOR STABILIZING THE AMPLITUDE AND REPETITION FREQUENCY OF A REPETITIVELY Q-SWITCHED LASER

Walter Koechner, Malibu, and Leonard Charles Debenedictis, Los Angeles, both of Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,517
Int. Cl. H01s 3/11
U.S. Cl. 331—94.5 **6 Claims**

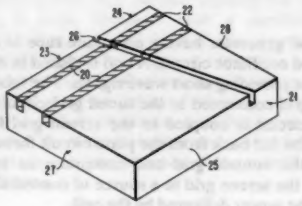


A technique for stabilizing the amplitude and repetition frequency of a repetitively Q-switched laser includes a first step or operation in which all light from each output pulse above a given amplitude level is removed to provide a series of output pulses having uniform amplitudes. A second step or operation then involves selecting a narrow time channel within the pulse width of each pulse at precise points in time to provide final output light pulses of uniform amplitude, pulse width, and repetition frequency.

3,747,020
POLARIZATION JUNCTION LASER

Harold Wieder, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,431
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 C **24 Claims**

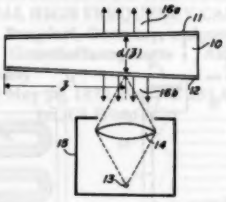


In a junction laser, the improvement is in providing a structure which inherently generates a preferred polarization enhancement. This comprises directing the light beams generated by at least a first and second laser element across a common Brewster angle surface separating the laser elements, while maintaining the external non-common faces of the laser elements parallel to form a Fabry-Perot resonator. Included is a structure and method description and application of the device.

3,747,021
WIDE RANGE CONTINUOUSLY TUNABLE THIN FILM LASER

Vern N. Smiley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 18, 1969, Ser. No. 842,914
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 C 4 Claims

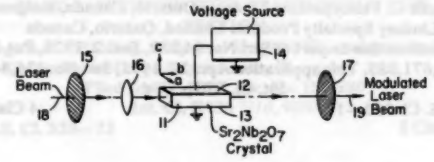


A thin film of laser material is prepared from two different compounds known to have lasing capabilities at different wavelengths and also having one component in common. The two compounds are caused to be deposited in a thin film layer of varying concentration so as to produce a final thin film of lasing material which changes in composition along a selected axis from a layer of laser material comprising substantially wholly one of the compounds, through varying gradient degrees of relative concentrations of the two compounds to a final gradient which may comprise substantially wholly the other compound of laser material. A source of excitation energy is provided, together with means for producing relative motion between the thin film of excitation energy so that the laser output is continuously tunable over an extremely broad band of outputs.

3,747,022
STRONTIUM NIOBATE ELECTRO-OPTIC MODULATOR

Satoshi Nanamatsu; Masakazu Kimura, and Kikuo Doi, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 19, 1971, Ser. No. 126,229
Claims priority, application Japan, Mar. 20, 1970, 45/24316
Int. Cl. H01s 3/02
U.S. Cl. 332—7.51 4 Claims



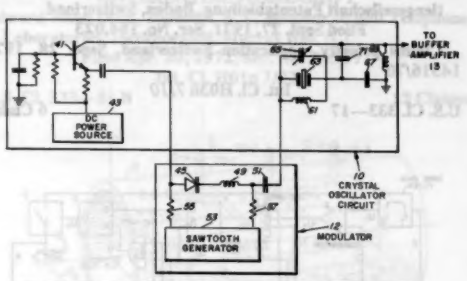
A single domain crystal of strontium niobate exhibits a substantial transverse electro-optic effect. Intensity, frequency and phase modulators for laser beams, or the like either continuous or pulse, utilizing the strontium niobate crystal may be operated over a broad bandwidth including the visible spectrum at low modulation voltage and power.

3,747,023
VOLTAGE CONTROLLED CRYSTAL OSCILLATOR

Donald J. Heft, Holliston, and John B. Wallace, Southboro, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 1, 1971, Ser. No. 148,364
Int. Cl. H03c 3/28, 3/22
U.S. Cl. 332—26 1 Claim

A voltage-controlled crystal oscillator circuit for use in various kinds of electronic apparatus is shown. The preferred embodiment consists of voltage sensitive capacitor, as a varactor, in circuit with a crystal and a compensating tuned circuit, the

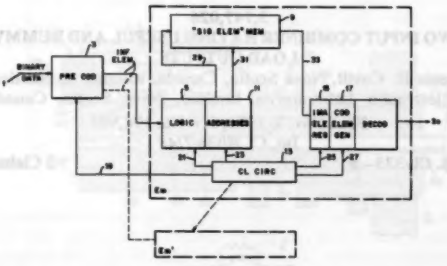


latter being adjustable as desired to eliminate the effects of nonlinearity in the impedance characteristics of the crystal and the varactor as the voltage across the varactor is varied.

3,747,024
MEMORY CONTROLLED MULTIPLE PHASE SHIFT MODULATOR

Michel F. Choquet, Les Pins Vence, and Henri J. Nussbaumer, Lagaude, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1971, Ser. No. 193,813
Claims priority, application France, Oct. 29, 1970, 7040292
Int. Cl. H04l 27/20
U.S. Cl. 332—9 R 4 Claims

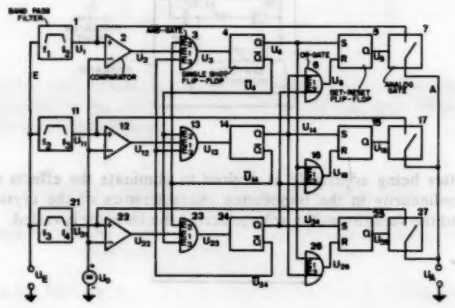


In a multiple phase or differential phase modulator encoding successive groups of N digital data bits occurring at data rate $1/T$ into signals of the form $(\sin X/X)\cos(wt+\phi_i)$, wherein each encoded signal exercises a progressively diminishing intersignal interference of time duration RT. The modulator includes an addressable memory where coded phase shift increments $\Delta\phi = k2\pi/M$ ($k = 0, 1, 2 \cdots -M-1$) are stored and which upon extraction are applied to an output signal combining network. Each incoming digital data group is converted into one of $2^N = M$ raw memory addresses. The i^{th} address is modified by logically combining it with $i^{th}-1$ previous address and by extracting it and the contents of the $i-(R-1)$ previous addresses to form a summed or composite signal in the time period prior to processing the $i^{th}+1$ raw memory address, the contents of the modified address constituting in effect a signal predistorted to compenstate for the intersignal interferences of the R previous signals.

3,747,025
ELECTRICAL FILTER CIRCUIT

Paul Iten, Oberrohrodorf, and Jiri Mastner, Niederrohrdorf, both of Switzerland, assignors to Brown, Boveri & Cie, Aktiengesellschaft Patentabteilung, Baden, Switzerland

Filed Sept. 27, 1971, Ser. No. 184,023
Claims priority, application Switzerland, Sept. 28, 1970, 14316/70
Int. Cl. H03h 7/10
U.S. Cl. 333—17 6 Claims

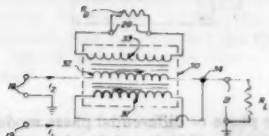


The present electrical filter circuit has a plurality of filter paths connected in parallel to each other between an input and an output. At the input side of each path there is arranged a bandpass filter which is then followed by logic circuit and bypass means interconnected in such a manner that only one path at a time is closed to the exclusion of all other paths in response to the signal level at the output of the respective bandpass filter means.

3,747,026
TWO INPUT COMBINER HAVING USEFUL AND DUMMY LOAD OUTPUTS

Dennis H. Covill, Nova Scotia, Canada, assignor to Nautical Electronics Laboratories Limited, Nova Scotia, Canada

Filed Nov. 2, 1971, Ser. No. 194,985
Int. Cl. H03h 7/48
U.S. Cl. 333—6 3 Claims

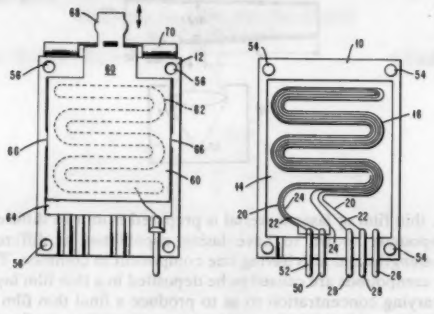


A four-port combining network which utilizes a single transformer element. The two input ports are supplied with radio frequency signals of the same frequency and phase. One output port is connected to a useful load such as an antenna. The other output port is connected to a dissipative "dummy" load. Under normal operating conditions the two input signals add to provide a single high power output and essentially no signal is fed to the dummy load. In the event of failure of one input signal the remaining operating input signal is divided between the two output ports. Respective isolation under all conditions is maintained between the two inputs ports.

3,747,027
DIRECTIONAL COUPLER SWITCH WHEREIN STRIPLINE GROUND CONDUCTOR IS MOVED RELATIVE TO STRIPLINE COUPLING CONDUCTORS

Murray H. Bolt, Raleigh, N.C., and Edward C. Uberbacher, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 7, 1972, Ser. No. 269,655
Int. Cl. H01p 1/10, 5/14
U.S. Cl. 333—7 9 Claims

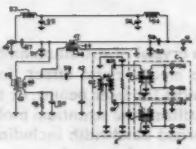


A directional coupler electric switch is provided having a housing circuit half and a housing cap half. A circuit card located within the housing circuit half has a stripline directional coupler circuit on the outer side and a grounding surface on the inner side. A second circuit card located within the housing cap half has a grounding circuit on the inner side. Connecting means are provided for the circuits within the housing at an edge thereof. The housing circuit half and the housing cap half are engaged so that the stripline directional coupler circuit is between the first and second circuit cards. The circuit card in the housing cap half is adapted to move relative to the other circuit card in the other housing half such that the grounding circuit can be moved into and out of coupling relationship with the stripline directional coupler circuit.

3,747,028
DIRECTIONAL TAP COMPRISING PI-SECTION HIGH PASS FILTER FOR USE IN CATV SYSTEM

Frank C. Pennypacker, Lindsay, Ontario, Canada, assignor to Lindsay Specialty Products Limited, Ontario, Canada

Continuation-in-part of Ser. No. 94,230, Dec. 2, 1970, Pat. No. 3,671,885. This application Apr. 22, 1971, Ser. No. 136,443
Int. Cl. H01p 5/14
U.S. Cl. 333—10 4 Claims



Combination directional couplers and splitters for extracting controlled fractions of signal power, for use in CATV or similar signal distribution systems and having improved operating characteristics are obtained by the incorporation of pi-section high-pass filters into such integrated devices. Conventional directional taps are modified by the addition of inductances and capacitances so that the required pi-section high-pass filters are formed, with one inductive element of such a filter being constituted by an inductive deviation,

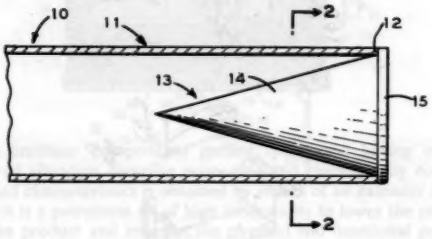
specifically a leakage inductance of an existing component of such a device. Improved radio frequency signal return losses and isolation are provided over a much greater frequency range than was heretofore possible while permitting effective distribution of signal power to a plurality of tap lines.

3,747,029

TERMINAL RESISTOR FOR WAVEGUIDES AND COAXIAL HIGH FREQUENCY CABLES

Klaus Prinzhorn, Burgdorf, Germany, assignor to Kabel- und Metallwerke Gutenhoffnungshutte Aktiengesellschaft, Hanover, Germany

Filed May 10, 1972, Ser. No. 251,870
Int. Cl. H01p 1/26
U.S. Cl. 333—22 R **6 Claims**



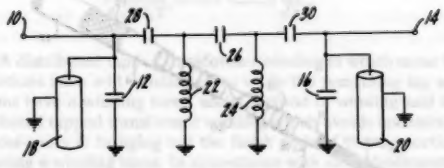
A terminal resistor or load for waveguides and coaxial high frequency cables; the resistor being formed from selected electrically conductive synthetic resin materials. Such resistors or loads being distinguished by being frequency independent; meeting exacting absorption properties; and retaining its effectiveness under extreme conditions of mechanical wear and tear.

3,747,030

BAND PASS FILTER WITH TRANSMISSION LINE SECTION

Eugene C. Walding, Arlington Heights, Ill., assignor to Oak Electro/Netics Corp., Crystal Lake, Ill.

Filed June 7, 1971, Ser. No. 150,580
Int. Cl. H03h 7/10, 9/00
U.S. Cl. 333—73 **5 Claims**



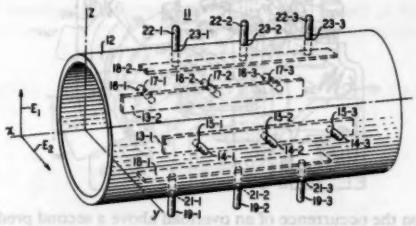
A filter circuit formed of inductive and capacitive elements and arranged to pass a predetermined band of frequencies. A transmission line section having a length e
of the wave length of a predetermined frequency above the pass band is connected either at the filter input, the filter output, or at each end of the filter to provide high attenuation at the predetermined frequency.

3,747,031

DIFFERENTIAL ATTENUATOR HAVING A ZERO NET DIFFERENTIAL PHASE-SHIFT

Edward Allen Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 20, 1972, Ser. No. 245,971
Int. Cl. H01p 1/22
U.S. Cl. 333—81 B **12 Claims**



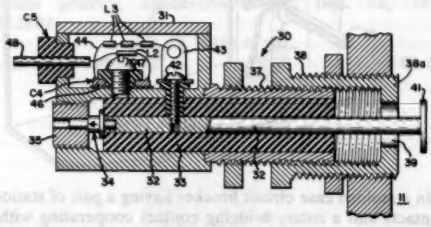
A differential attenuator having a substantially zero net differential phase-shift. The aforesaid zero net differential phase-shift is realized by disposing phase-shift means within the attenuator to provide a differential phase-shift which cancels the differential phase-shift induced by the attenuator attenuating elements.

3,747,032

ARRANGEMENT FOR PROVIDING IMPROVED LINEARIZATION OF THE VOLTAGE-FREQUENCY CHARACTERISTIC OF A RESONANT CIRCUIT HAVING A VOLTAGE-VARIABLE CAPACITY DIODE

James A. Hall, and Harry J. Peppiatt, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Oct. 29, 1971, Ser. No. 193,885
Int. Cl. H01p 7/04; H03c 3/20
U.S. Cl. 333—82 B **1 Claim**



A voltage-variable capacity diode is coupled through a one-third wavelength transmission line to a resonant cavity. The capacity of the diode is varied by a modulating voltage so as to change the resonant frequency of the cavity, and hence the resonant frequency of an oscillator. The transmission line causes the resonant frequency of the cavity to vary more linearly over a relatively wide band as a function of the modulating voltage.

3,747,033

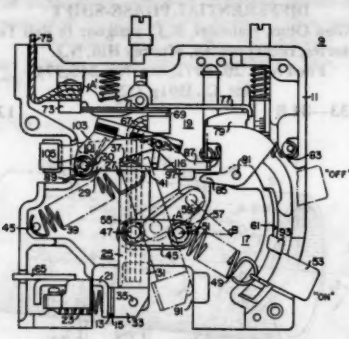
CIRCUIT BREAKER WITH IMPROVED TRIP MEANS

Ronald E. Bennett, Conover, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 25, 1972, Ser. No. 220,667
Int. Cl. H01h 75/12
U.S. Cl. 335—35 **7 Claims**

A circuit breaker is provided with improved compactly constructed trip means comprising a thermal trip operable with time delay in response to a sustained overload above a first

predetermined value to effect automatic opening of the breaker and an electromagnetic trip operable instantaneously



upon the occurrence of an overload above a second predetermined value to effect automatic opening of the breaker.

3,747,034

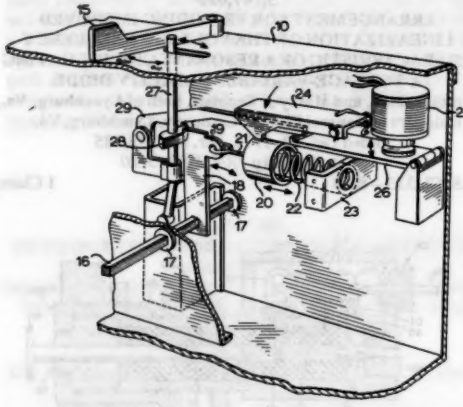
CIRCUIT BREAKER

Ronald M. Howchin, 1055 Bloor St., East, Apt. 1220, Mississauga, Ontario, Canada

Filed Sept. 28, 1972, Ser. No. 293,046

Int. Cl. H01h *73/04*

U.S. Cl. 335—38 **11 Claims**



In a molded case circuit breaker having a pair of stationary contacts and a rotary bridging contact cooperating with the stationary contacts to provide a double break, the bridging contact is free floating, being connected to a rotary carrier through spring toggle mechanisms which operate when the carrier is rotated so as to rotate the bridging contact about its floating axis. The bridging contact carries two pairs of contact members adapted to engage and disengage at different times, one pair of contacts being interconnected by a resistive current path to minimize arcing.

3,747,035

ELECTROMAGNETIC RELAY

Ikuhisa Morimoto; Hiroaki Fujimoto, both of Tsu-shi, Mie-ken; Kiyoshi Yamada, Hirakata-shi, Osaka, and Kowashi Hisano, Tsu-shi, Mie-ken, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

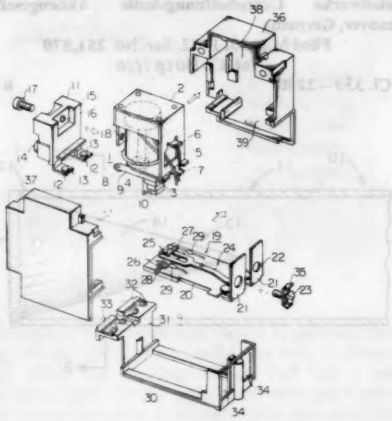
Filed Apr. 7, 1972, Ser. No. 241,970

Claims priority, application Japan, Apr. 21, 1971, 46/25799

Int. Cl. H01h *51/06*

U.S. Cl. 335—106 **1 Claim**

An electromagnetic relay having main and auxiliary contacts which are arranged in two blocks. Main contact block includes an electromagnet device and an armature pivotably engaged to an end of yoke and having an insulator base fixed to one side of the armature and a movable contact spring secured to said insulator base. Auxiliary contact block comprises an insulator plate, an auxiliary movable contact spring fixed at an end to said insulator plate, at least an auxiliary movable contact fixed to the other free end of said auxiliary movable contact spring, and at least an auxiliary fixed contact fixed to said insulator plate so as to oppose said auxiliary movable contact.



The two blocks are fitted in a covering means adapted to hold them in positions, in which said auxiliary movable contact spring of the auxiliary contact block is driven through said insulator base of the armature of the main contact block upon attraction of the armature. The electromagnet of the main contact block has an auxiliary iron core provided in contact with a central axial iron core and disposed in a space in a frame of bobbin, and a permanent magnet provided in contact with said auxiliary iron core. The electromagnet is in contact with the yoke on the side of said permanent magnet.

3,747,036

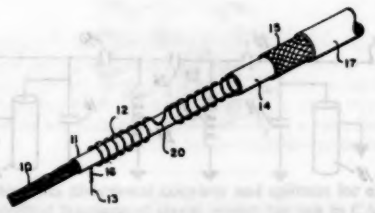
MAGNETIC LINE SENSOR

David P. Erdmann, Hopkins, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 17, 1972, Ser. No. 218,102

Int. Cl. H01f *15/04*

U.S. Cl. 336—84 **10 Claims**



A magnetic intrusion line sensor in the form of a single flexible cable for easy installation in a narrow trench. The sensor is fabricated by winding a coil of sensing wire around a core of multi-strand magnetic wire, the sensing wire winding being reversed in direction at predetermined intervals to provide cancellation of far-field noise, while enhancing the signal caused by the local magnetic disturbance.

3,747,037

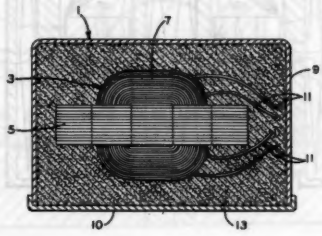
PETROLEUM BASED OIL MODIFIED CASTOR OIL-URETHANE COMPOSITION FOR ELECTRICAL POTTING

Mason H. Earing, Danville, Ill., assignor to General Electric Company, Ft. Wayne, Ind.

Continuation-in-part of Ser. No. 77,678, Oct. 2, 1970, abandoned, which is a continuation of Ser. No. 697,180, Jan. 11, 1968, abandoned. This application Nov. 15, 1971, Ser. No. 198,811

Int. Cl. C08g *22/08*

U.S. Cl. 336—96 4 Claims



A urethane composition potting compound having improved vibration damping properties and rheologically controlled characteristics is obtained by means of an extender oil which is a petroleum oil of high aromaticity to lower the cost of the product and improve the physical and functional properties of the potting material; the extender oil has a viscosity gravity constant greater than 0.95 and comprises greater than 55 percent by weight of the composition.

Prior to polymerization the oil extended isocyanate prepolymer and polyol is blended with silica so that the composition as a whole exhibits a quite unexpected combination of properties which make the product especially adapted for potting electrical components.

3,747,038

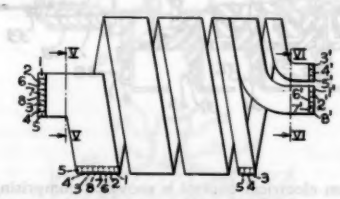
DISTRIBUTED TAPPED TRANSFORMER WINDING AND METHOD OF WINDING SAME

Jack W. McGill, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 2, 1972, Ser. No. 294,311

Int. Cl. H01f *21/12*, *15/10*

U.S. Cl. 336—150 6 Claims



A distributed tapped transformer winding in which some tap sections have $n+1$ winding turns while the remaining tap sections have n winding turns, and a method of winding said distributed tapped transformer winding which avoids undesirable cross-overs in bringing out the finish ends of the tap sections having n winding turns. In accordance with an embodiment of the invention, the conductors forming the tap sections having $n+1$ turns are positioned in the most "lagging" part of the winding bundel, relative to the direction of winding, and the conductors forming the tap sections having n winding turns are positioned in the "leading" part of the winding bundle. This arrangement permits the finish ends of the tap sections having n winding turns to be brought out for connection to a terminal board on the transformer without crossing over the turns of the tap sections having $n+1$ winding turns.

3,747,039

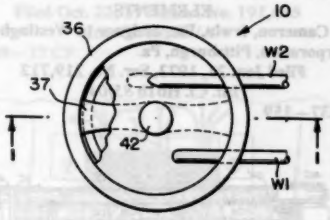
THERMOSTAT AND METHOD OF MAKING SAME

Charles John Hire, Rochester, N.Y., assignor to Fasco Industries, Inc., Rochester, N.Y.

Filed July 13, 1972, Ser. No. 271,293

Int. Cl. H01h *37/04*

U.S. Cl. 337—380 6 Claims



A cup-shaped metal can containing a thermostatic switch unit is mounted in an opening in the bottom of a cup-shaped plastic jacket, and has two terminals which project into the jacket and which have lead wires connected thereto. The wires extend out through notched openings in the side of the jacket, and are retained in those openings by a ring member which seats on the open end of the jacket and which has a diametral web at opposite sides of which the lead wires are disposed. The can has a flared open end; and the can and ring member are secured in place by epoxy flowed into the open end of the can and around its flared end and into the jacket to a point beneath the notched openings.

3,747,040

SELF-RECOVERING CURRENT LIMITER

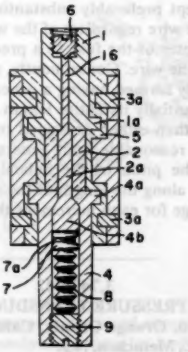
Takeo Inoue, Tarumi-ku, Kobe-shi, Hyogo-ken, and Takashi Shirazawa, Uosaki Higashinada-ku, Kobe-shi, Hyogo-ken, both of Japan, assignors to Mitsubishi Denki Kabushika Kaisha, Toyko, Japan

Filed Dec. 16, 1971, Ser. No. 208,568

Claims priority, application Japan, Dec. 16, 1970, 45/112681

Int. Cl. H01h *87/00*

U.S. Cl. 337—119 5 Claims



A self-recovering current limiter features an outer tubular casing of stainless steel or brass being constructed with spaced flanges provided on the interior surface inside each of the ends thereof and an inner tubular member composed of first and second electrodes and a separating axially aligned insulator tube of beryllia porcelain or alumina porcelain having corresponding flanges being larger in diameter than the inner diameters of the flanges of the outer tube. A glassy material of mica composition is packed between the inner tube and the

outer tube and an alkali metal is disposed in an elongate axial channel formed in the inner tube for normally providing conductivity between the first and second electrodes, but upon being vaporized by a short-circuiting current providing a high resistance to limit current flow therethrough.

3,747,041
CURRENT LIMITING FUSE WITH IMPROVED FUSE ELEMENTS

Frank L. Cameron, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1972, Ser. No. 219,712
Int. Cl. H01h *85/04*
U.S. Cl. 337—159 **10 Claims**

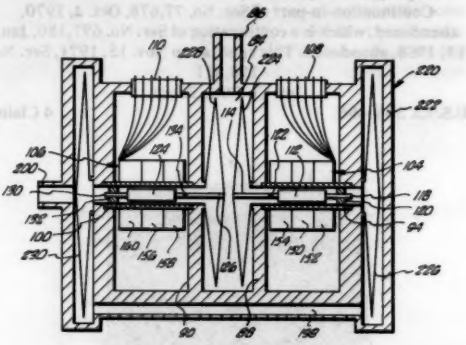
A cartridge type current limiting electrical fuse including at least one fuse element. The element is made from a length of fusible material which is tapered substantially along its legth to a minimum central taper point or portion and then widened again, or which is varied in discrete steps along its length. The fusible material is then wound into a helical or spring-like shape. However, the effective diameter of the resulting spring-like solenoid or helically wound coil is made to vary in accordance with the variation in the diameter of the fuse material. The smaller the diameter of the fuse material at any point along its length, the smaller is the diameter of the corresponding solenoid or coil at that point or portion. If the length of fusible material varies continuously between alternating maximum and minimum cross-sectional areas, the finished or overall helical coil or fuse element solenoid will vary continuously to form corresponding maximum and minimum alternating solenoid diameters. If the cross-sectional area of the fuse material varies discretely such as in steps, as would be the case if sections of fusible material of varying diameters or size were joined end-to-end, the corresponding solenoid or helical coil formed will also vary discretely. The size of the diameter for any section of wire depends upon the spring constant or spring rate developed in the solenoid or coil of fusible material. The spring rate is kept preferably substantially constant for any section of fusible wire regardless of the wire's diameter by adjusting the diameter of the fuse to a predetermined value for the diameter of the wire. Consequently, a spring-like fuse element is ultimately formed having a generally constant spring-rate along substantially its entire length. If the spring shaped fuse element is then either expanded or contracted longitudinally within a reasonable limit generally corresponding to Hooke's Law, the pitch of the helical spring element will remain constant along the length of the spring although naturally it will change for each increment the spring is expanded or contracted.

3,747,042
PRESSURE TRANSDUCER

James B. Sheldon, Orange County, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Aug. 24, 1971, Ser. No. 174,408
Int. Cl. H01c *13/00*
U.S. Cl. 338—42 **14 Claims**

A pressure transducer using diaphragm capsules. In a first general embodiment, operable to avoid failure due to extreme overpressure, a pair of nestable diaphragm capsules, differing one from the other in surface area and rigidity, are interconnected by a passageway, and the diaphragms and passageway are filled with a substantially incompressible fluid. In a second general embodiment, operable to cancel out inertial effects, pairs of diaphragm capsules are utilized. Each capsule forms an interface between the high and low pressures and the diaphragms are positioned in opposition to one another, so as

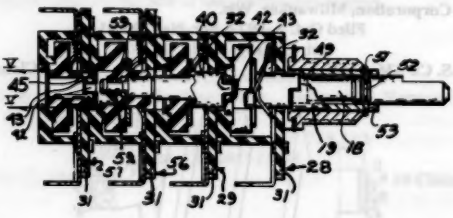


to move in opposite directions in response to a given change in pressure differential. A third general embodiment combines the first and second embodiments.

3,747,043
TANDEM ELECTRICAL CONTROL

John D. Van Benthuysen; Wilbert N. Budd, both of Elkhart, Ind., and Robert E. Cormican, Cherokee Village, Ark., assignors to CTS Corporation, Elkhart, Ind.

Filed Sept. 16, 1970, Ser. No. 80,520
Int. Cl. H01c *5/00*
U.S. Cl. 338—134 **17 Claims**

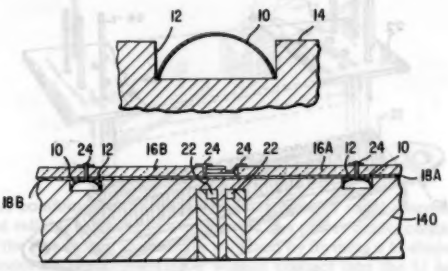


A tandem electrical control is provided comprising a plurality of housing sections and wherein two base assemblies are rigidly secured to the same housing section. Coupling straps disposed in channels in the housing sections maintain the control in assembled relationship. An outer tubular shaft for adjusting some of the sections independently of others adjusted by an inner shaft is secured to the inner shaft by means of a C washer abutting a bushing and extending through a groove in the wall of the outer tubular shaft into a reduced diameter portion of the inner shaft. Rattling between the two shafts is eliminated by disposing a portion of a tubular shaft of an actuator between the two shafts. Actuators that are to be simultaneously adjusted have coupling means in the form of driving lugs projecting from one of the actuators engaging lug receiving notches in another. One of the driving lugs is larger than the other to precisely orient the actuator and enable assembly in only one position.

3,747,044
MICROWAVE INTEGRATED CIRCUIT (MIC) GROUND PLANE CONNECTOR

Frank Emelio Vaccaro, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,077
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 5 Claims

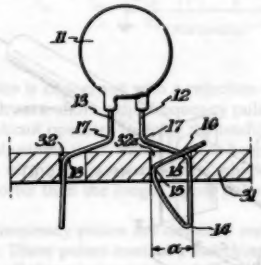


Electrical connector formed of a beryllium copper spring metal and situated to make electrical connection between the ground planes of separate MIC substrates. The connector is resiliently seated in retaining slots in the base of the housing and formed to extend above the plane of the base in which the grooves are formed to make contact between ground planes of the separate MIC substrates. The spring metal is formed with a heat treatment to provide hardness and spring tension that assures a reliable electrical connection.

3,747,045
LEAD LOCKING CONFIGURATION FOR ELECTRICAL COMPONENTS

Hans A. Stross, Kennebunk, Maine, assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 19, 1971, Ser. No. 135,259
Int. Cl. H05k 1/18
U.S. Cl. 339—17 C 6 Claims

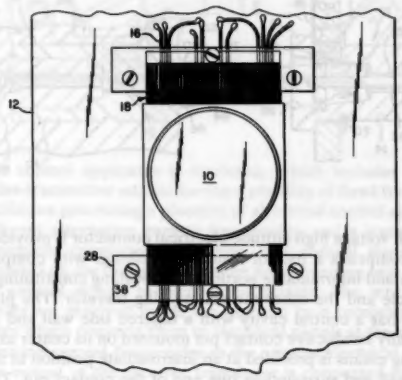


The lead configuration of an electrical component is such that one of the leads locks into position in an aperture of a wiring board when the unit is inserted therein with nominal pressure. This configuration allows the unit to slide only so far into the aperture before it locks in place, thereby prohibiting the unit from being inserted any further, or from falling out of position if the board were inverted. These units remain locked in an upright position on the wiring board for the purpose of being further secured thereon, as by wave soldering.

3,747,046
RECEPTACLE FOR LARGE SCALE INTEGRATED CIRCUIT (L.S.I) PACKAGE

Phillip L. Watkins, Rockville, Md.; Raymond W. Cox, Annandale, Va.; John M. Carl, Oxon Hill, Md., and John F. Judd, Falls Church, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1971, Ser. No. 191,695
Int. Cl. H05k 1/04
U.S. Cl. 339—17 CF 1 Claim

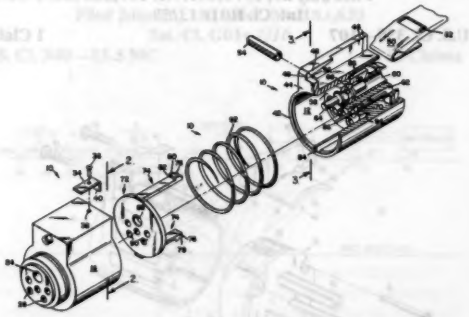


This invention relates to a receptacle for releasably receiving an LSI package, and more particularly to improved circuit connections.

3,747,047
LATCHABLE INTEGRALLY MOLDED ELECTRICAL CONNECTOR

David P. Carter, Baldwin Park, Calif., and Terry J. Peterson, Honolulu, Hawaii, assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 1, 1971, Ser. No. 203,761
Int. Cl. H01r 13/42, 13/44
U.S. Cl. 339—42 8 Claims

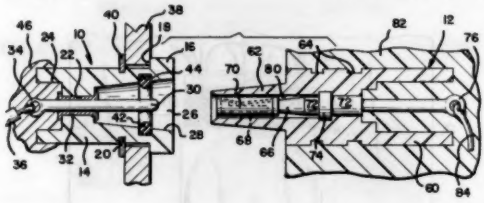


An electrical connector is disclosed comprising two axially joined and latched insulating connector bodies. Each body is formed with a plurality of electric contact bores. Along a portion of each contact bore is disposed an integrally molded contact retaining mechanism having a pair of deflectable fingers, shaped and sized such that when each contact is inserted into its respective bore, an enlarged portion of the contact expands the diametric spacing of inwardly projecting buttress portions of those fingers. This diametric spacing then contracts to a relaxed position with the buttress portions restraining the inserted contact from axial motion. The front portion of each retaining mechanism finger is inwardly tapered to facilitate contact removal.

3,747,048
HIGH VOLTAGE CONNECTOR

Erlon Fitch Johnson, Elizabethtown, and Kenneth Oscar Kopenhaver, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 19, 1971, Ser. No. 173,188
Int. Cl. H01r 13/52, 13/54
U.S. Cl. 339—75 R 2 Claims

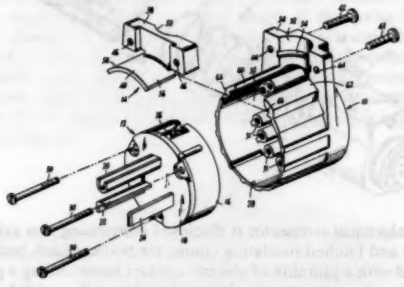


A high voltage high altitude electrical connector is provided which comprises a pair of insulating bushings with complementary and intermatable portions, one bushing constituting a receptacle and the other the mating plug therefor. The plug bushing has a central cavity with a tapered side wall and an electrically conductive contact pin mounted on its center axis. A sealing means is provided at an intermediate position in the cavity wall and surrounding one end of the contact pin. The receptacle bushing has a forward protrusion, the outside surface of which is tapered and shaped to be complementary to the plug cavity. A metal socket contact member which receives the contact pin therein is mounted centrally in the receptacle bushing. Suitable termination mmeans are provided at the opposite ends of the pin and the socket.

3,747,049
STRAIN RELIEF FOR ANGLE PLUG

Robert C. Cressman, East Greenwich, and Luther M. Sheldon, Cranston, both of R.I., assignors to General Electric Company, Providence, R.I.

Filed July 29, 1971, Ser. No. 167,389
Int. Cl. H01r 13/58
U.S. Cl. 339—107 1 Claim

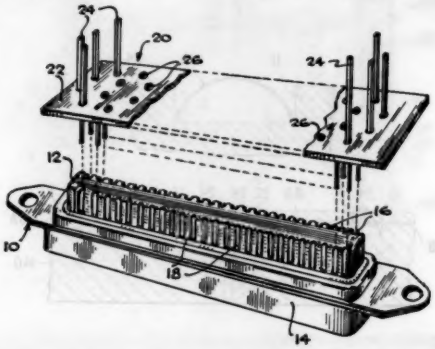


A cable indexing angle cap is provided having a cable clamp and power blades extending generally at right angles to each other. Reinforcement of the cable grip is achieved by including a keyway in the side wall of the angle cap and closing the side wall opening with a keyed wall portion formed integrally with the lower member of the cable clamp.

3,747,050
ADAPTOR

Rudolph A. Hecht, Lincroft, N.J., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 19, 1972, Ser. No. 245,537
Int. Cl. H01r 5/08, 13/50
U.S. Cl. 339—156 A 1 Claim

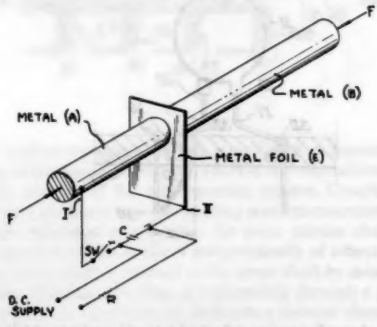


An adaptor for use with a high contact density connector to permit use of wire wrap posts in conjunction with the connector, the adaptor being defined by support means characterized by a generally planar member having a plurality of spaced openings extending therethrough with wire wrap posts being supported in the planar member and disposed in the openings thereof, said wire wrap posts being engageable with the terminal tails of the contacts of the connector and thereafter soldered thereto.

3,747,051
WELDING METHOD AND MEANS USING FOIL ELECTRODE

Robert Charles Swengel, Sr., Hellam, and J. A. Crumley, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 720,777, April 12, 1968, abandoned.
This application July 16, 1970, Ser. No. 55,614
Int. Cl. H01r 5/04
U.S. Cl. 339—275 T 10 Claims



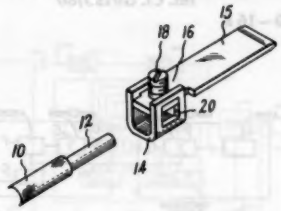
A welding method and means is disclosed utilizing a conductive foil disposed between or adjacent members to be welded together with the foil serving as one electrode and one or both of the members serving as another electrode of the welding circuit and with the members being forced together or with the foil being forced against the members by a separate electrode.

3,747,052

CLAMP FOR BLADE FOR HIGHER RATING DYNA-MATE CAPS

Luther M. Sheldon, Cranston, R.I., assignor to General Electric Company, Providence, R.I.

Filed June 24, 1971, Ser. No. 156,179
Int. Cl. H01r 11/10
U.S. Cl. 339—272 VC 1 Claim



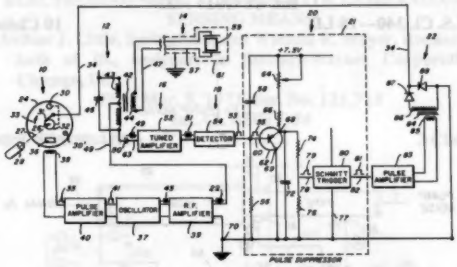
A conductor clamp is provided capable of rapid assembly and reliable securing of a conductor to a power blade, contact or the like. Rapid assembly is achieved by forming a U-shaped conductor troth, inserting a winged contact into the U and rotating the winged contact to bring the wings into engagement with conforming slots in the uprights of the U. A screw threaded through the winged contact prevents disassembly.

3,747,053

NOISE REJECTION CIRCUIT

Garland R. Austin, Tulsa, Okla., assignor to Lowrance Electronics Mfg. Corp., Tulsa, Okla.

Filed Aug. 20, 1971, Ser. No. 173,479
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R 7 Claims



This invention is concerned with a rejection circuit for discriminating between short radio frequency pulses of different lengths. The circuit operates to delay the leading edges of the pulses by an adjustable time, which is set to be greater than the time duration of the short noise pulses, which are to be rejected, but shorter than the longer signal pulses which are to be passed.

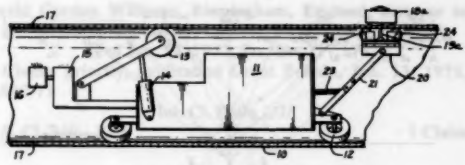
The radio frequency pulses are detected and converted to square pulses. These pulses control a switching means that is conducting at all times, except when the pulse occurs. When the switch becomes non-conducting, a capacitor connected across the switch begins to charge. This voltage controls a Schmitt trigger circuit, such that when the voltage reaches a selected threshold value, the Schmitt trigger starts putting out a square pulse. This pulse ends when the detected pulse ends, and the switch starts to conduct, and the capacitor voltage rapidly drops to a low value. By the use of an adjustable resistance, the charging of the capacitor can be slowed down to the point where its voltage never reaches the threshold value in the short time duration of the noise pulses.

3,747,054

WIRELESS CONTROL OF MACHINES INSIDE A PIPELINE

Kiryako Arvanetakis, Houston, Tex., assignor to Monroe X-Ray Company, Inc., Monroe, La.

Filed Jan. 5, 1970, Ser. No. 696
Int. Cl. H04b 11/00; G01n 23/00
U.S. Cl. 340—15 12 Claims



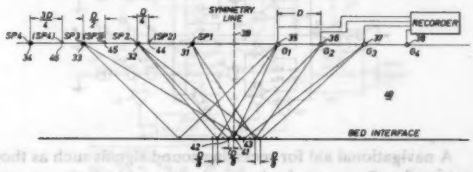
A control apparatus is disclosed, which includes an encoder-transmitter section having a plurality of fixed frequency oscillators generating a plurality of electrical control signals at different alternating current frequencies, and a transmitting transducer connected to receive said control signals and mounted on the outside of pipeline for converting said electrical control signals to mechanical signals. The mechanical signals are received inside the pipeline by a receiving transducer which converts them to electrical signals at the same alternating current frequencies as the original electrical signals. The output of the receiver transducer is connected to a plurality of parallel connected decoder circuits. Each encoder circuit provides an output signal in response to receipt of a alternating current signal of a certain frequency and this output signal may be conducted to one of the control mechanisms in a machine in the pipeline for operating the mechanism.

3,747,055

HIGH RESOLUTION SHOOTING WITH SPACE DOMAIN FILTERING

Eugene F. Greene, Jr., Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 16, 1971, Ser. No. 153,631
Int. Cl. G01v 1/16
U.S. Cl. 340—15.5 MC 16 Claims

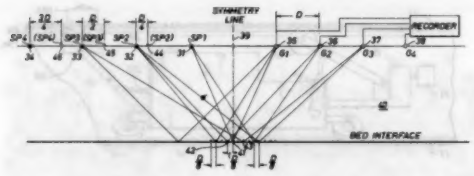


An illustrative embodiment of the invention includes methods for obtaining and enhancing seismic data from closely spaced subsurface reflection points using a minimal number of seismic energy generation. In the method of the invention the shot point to shot point spacing or the seismometer to seismometer spacing are varied in a systematic manner to produce reflections from closely adjacent, but spatially separated, reflection points. These reflections produce seismic traces which are then combined by the application of spatial filter operators to enhance the accuracy of the data for a given reflection point trace.

3,747,056
HIGH RESOLUTION REFLECTION SHOOTING WITH DATA MIXING

James Alva Treybig, and Eugene Franklin Greene, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y., by said Treybig

Filed June 16, 1971, Ser. No. 153,553
Int. Cl. G01v 1/28
U.S. Cl. 340—15.5 MC 6 Claims

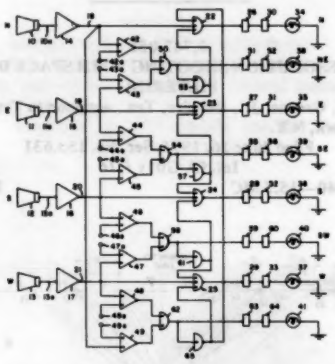


An illustrative embodiment of the invention includes methods for obtaining seismic data from closely spaced subsurface reflection points using a minimal number of seismic energy generations. In the method of the invention the shot point to shot point spacing or the seismometer to seismometer spacing are varied in a systematic manner calculated to produce reflection from close, but not the same, subsurface bed interface areas. The data produced by reflections from the close subsurface bed interface areas may then be combined using data averaging techniques.

3,747,057
NAVIGATIONAL AID FOR RECEIVING SOUND SIGNALS

Jack L. Brougher, 19081 Dagmar Dr., Saratoga, Calif.

Filed Nov. 10, 1971, Ser. No. 197,334
Int. Cl. G01s 3/80
U.S. Cl. 340—16 R 1 Claim

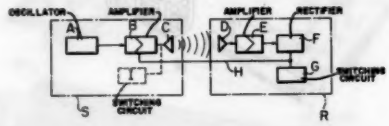


A navigational aid for receiving sound signals such as those originating from people, buoys, boat or ship foghorns, etc., from any direction, and using them in aiding the navigation of a vehicle or craft especially when visibility is limited as by fog, rain, haze, smoke or during the nighttime. This device may also be used for search and rescue operations in locating lost people and animals. Still an additional use is in military operations to locate personnel/equipment during nighttime or obscured visibility conditions. Another use is the direction/vector location of aircraft in the air or on the ground during obscured visibility conditions. This device employs one or more sound receivers which convert the received sound signals into electrical signals. The electrical signals are supplied to a logic network to control indicating devices which indicate the direction from which the sound was received.

3,747,058
ULTRASONIC DETECTION APPARATUS

Shinsuke Okamoto, Nishinomiya; Hiromitsu Unoue, Kyoto; Hirosi Ohasi, Neyagawa; Hirokazu Mori, Osaka, and Shojiro Kawaguchi, Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 8, 1971, Ser. No. 187,635
Claims priority, application Japan, Oct. 15, 1970, 45/90723; May 26, 1971, 46/43565
Int. Cl. G01s 3/80
U.S. Cl. 340—16 R 4 Claims

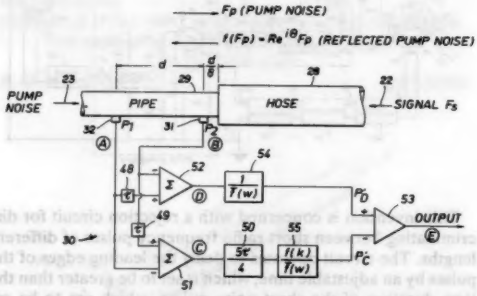


This invention relates to an ultrasonic detection apparatus, in which ultrasonic wave is produced by a constant frequency oscillator provided at the side of transmission, said wave is transmitted through a transmitting transducer and received by a receiving transducer, the output of the receiving transducer is amplified and rectified, and then a part of the thus rectified output is positively fed back to an amplifier of the transmittance side through a variable gain circuit.

3,747,059
ELECTRONIC NOISE FILTER WITH MEANS FOR COMPENSATING FOR HOSE REFLECTION

Donald J. Garcia, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,433
Int. Cl. G01v 1/22
U.S. Cl. 340—18 LD 10 Claims

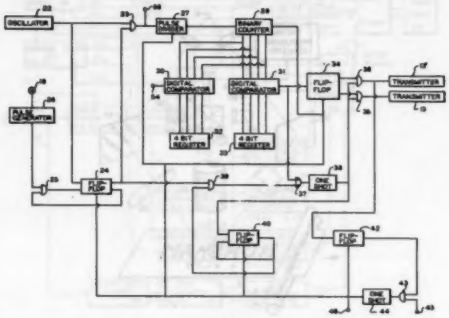


An illustrative embodiment of the present invention includes methods and apparatus for detecting pressure pulse signals from a remote signalling device in the mud line of a well while the well is being drilled and in the presence of mud pump pressure pulse noise. The apparatus and method includes placing plural pressure sensitive transducers in the mud line on the mud pump side of the flexible hose portion thereof. Electrical signals representative of the pressure in the mud line sensed by the transducers are processed to take into account the amplitude and phase shift effect of the hose. The processed signals are then combined to directionally discriminate against the mud pump noise pulses wihie detecting pulses from downhole.

3,747,060
SIGNAL GENERATING AND RECORDING APPARATUS WITH TIME DELAY

Earl L. DeShazo, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 14, 1970, Ser. No. 72,026
Int. Cl. G01v 1/40; G01d 9/10; G04f 3/06
U.S. Cl. 340—18 P 8 Claims

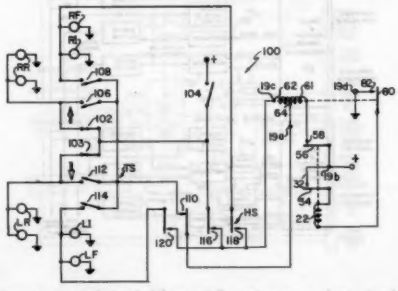


Two signal generators, such as sonic logging transmitters, are actuated sequentially by a circuit which includes an oscillator and a pulse generator. The delay between the actuations is established by a comparison circuit which compares counts registered on a counter with a preset count. Circuit means are also provided for converting received analog signals to digital form and recording the digital signals.

3,747,061
ELECTROMAGNETIC FLASHER WITH LAMP FAILURE SENSING MEANS

Arthur J. Little, Springfield, and William R. Mayer, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 8, 1971, Ser. No. 121,715
Int. Cl. B60q 1/38
U.S. Cl. 340—80 3 Claims

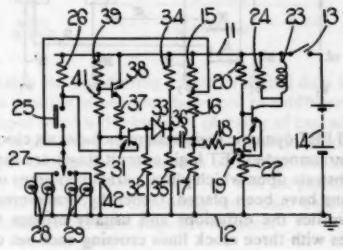


An electromagnetic vehicle turn signal flasher in which lamps are lighted and a bulb outage relay is energized through normally closed contacts on operation of the turn signal switch. The relay armature operates to energize a timing relay, which deenergizes itself and momentarily opens the normally closed contacts to deenergize the outage relay and extinguish the lamps. The contacts, on reclosing, relight the lamps and energize the outage relay to repeat the cycle. The outage relay armature either does not operate or releases before the closed contacts have opened, if a lamp has failed, to maintain the dashboard indicator lamp continuously lighted for signalling the lamp failure. To enable the operated outage relay armature to release on lamp failure, the armature is held a predetermined distance from the core so that as the resistance of the remaining energized lamp filaments increases, the outage relay current decreases sufficiently to cause armature release.

3,747,062
DIRECTION INDICATING SYSTEMS FOR ROAD VEHICLES

David Gordon Williams, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 12, 1972, Ser. No. 217,176
Claims priority, application Great Britain, Jan. 13, 1971, 1,590/71
Int. Cl. B60q 1/38
U.S. Cl. 340—81 F 1 Claim

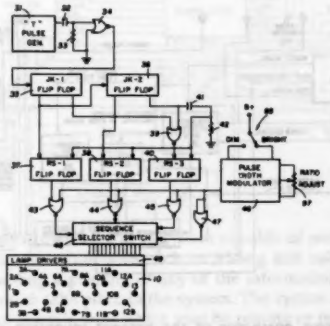


A direction indicating system for a road vehicle has a direction indicator switch operating in the usual manner, but having a resistor in series with it. Control means is provided operable by the voltage across said resistor for increasing the frequency of operation if a lamp fails.

3,747,063
BISTABLE CIRCUIT CONTROLLED SEQUENTIAL LAMP INDICATOR

James Elmore Hudson, Jr., Dallas, Tex., assignor to Simplec Mfg., Co., Dallas, Tex.

Int. Cl. H04g 5/00; H05b 37/00
U.S. Cl. 340—109 R 5 Claims

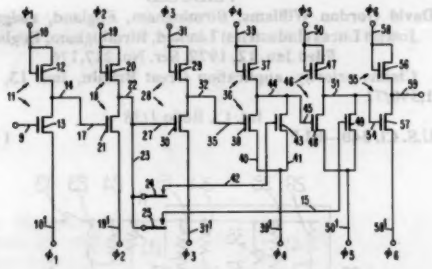


Sets of lamps arranged in adjacent opposed arrowhead configurations with each lamp energized by means of individual switching transistors having base drive voltages coupled through a multi-position switch to timing signals. The timing signals are generated by sequentially actuated flip-flops energized in response to impulses from a master clock and gating circuitry. Opposite directions are indicated by selectively energizing three sets of lamps forming three adjacent arrowheads, sequentially, in one direction, three similar sets in another direction, or by steadily illuminating one set of lamps forming an arrowhead while sequentially energizing lamps forming a shaft.

3,747,064
FET DYNAMIC LOGIC CIRCUIT AND LAYOUT

Gerhard R. Thompson, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1971, Ser. No. 158,317
Int. Cl. H03k 19/08
U.S. Cl. 307—205 8 Claims

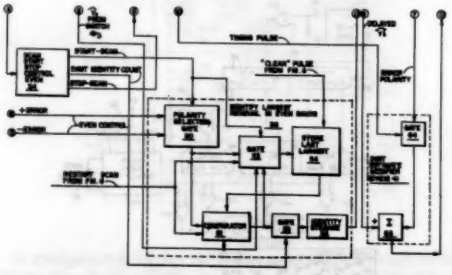


An MOS FET dynamic logic system includes six clock phase inputs. Interconnected FET logic curcuit stages are formed on a wafer substrate upon which plural parallel columns or stacks of diffusions have been placed. Generally, transverse metallization overlies the diffusions and usually crosses them at right angles with three clock lines crossing each set of diffusions. Successive stages are interconnected based upon rules which define phase relationships which are permissible for providing valid logic operations. Only one of a cyclically operating sequence of phase defining clocks is connected to each stage.

3,747,065
SYSTEM FOR CORRECTING DETECTED ERRORS IN A HIGH SPEED DIGITAL DATA TRANSMISSION SYSTEM

Earl D. Gibson, Huntington Beach, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed May 12, 1972, Ser. No. 252,880
Int. Cl. G06f 11/00; G08c 25/00
U.S. Cl. 340—146.1 R 6 Claims

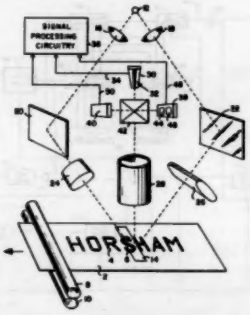


The error corrector of the present invention operates in conjunction with an error detector which error detector provides outputs indicating that an error has occurred, the polarity of the error and an indication as to whether the error has occurred an even or odd time interval. Specifically, the error corrector, upon being informed that an error has occurred, scans a group of previously estimated residual signals to determine which residual has the largest amplitude and a polarity opposite to the indicated error or polarity. The error corrector then identifies the particular digit estimate associated with the indicated largest residual and either adds or subtracts one level to that estimated digit, depending on the polarity of the indicated error. In most applications, the one correction corrects the detected error.

3,747,066
OPTICAL SCANNER AND SIGNAL PROCESSING SYSTEM

Ralph T. Vernot, Philadelphia, and Jimmie Neill, Hatboro, both of Pa., assignors to OCR Systems, Inc., Horsham, Pa.

Filed Aug. 23, 1971, Ser. No. 173,822
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 AG 8 Claims

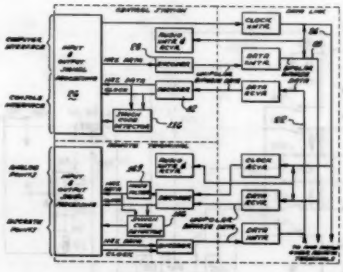


The reflectance of each small area on a document being scanned by a photosensitive device in an array of photosensitive devices is compared with the reflectance of a larger surrounding region in order to generate a video signal for identifying the parts of a printed character or other pattern, which minimizes the effects of variations in document reflectance, variations in incident light intensity and noise.

3,747,067
METHOD AND APPARATUS FOR DATA TRANSMISSION

Duane C. Fox, Fullerton; Richard Y. Ichinose, and Tal E. Klaus, both of Placentia, all of Calif., assignors to American Multiplex Systems, Inc., Anaheim, Calif.

Filed Aug. 30, 1971, Ser. No. 176,228
Int. Cl. H04b 1/16; H04q 1/00
U.S. Cl. 340—147 SY 14 Claims

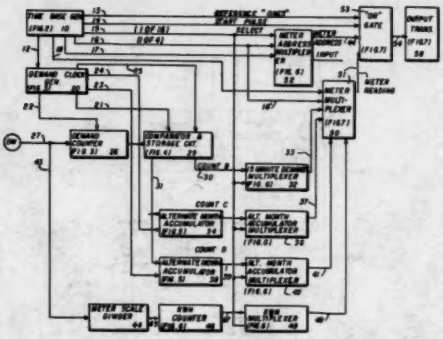


Method and apparatus for multiplex data transmission wherein binary control messages and a corresponding clock signal are transmitted from a central station through two transformer circuits to a plurality of remote terminals for control and monitoring of parameter points. A binary response message is transmitted from a remote terminal through a third transformer circuit back to the central station where a preset synchronous decoder converts the message from biphase waveform to non-return-to-zero waveform, and also generates a corresponding clock signal. A preset pattern recognition circuit assures word synchronization and a filter eliminates noise interference in the binary messages. Audio intercommunication simultaneous with the binary message transmission is provided through the transformer circuits.

3,747,068
REMOTE METER READING SYSTEM FOR KWH WATTHOUR METERS AND DEMAND METERS

James N. Bruner, and Dan McAuliff, both of Springfield, Ill., assignors to Sangamo Electric Company, Springfield, Ill.

Filed Nov. 4, 1971, Ser. No. 195,695
Int. Cl. G01r 11/64
U.S. Cl. 340—151 24 Claims

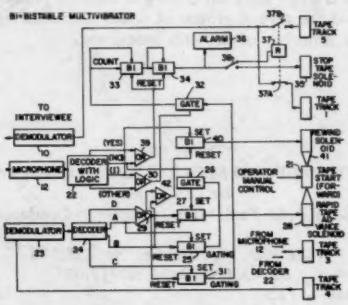


A remote meter reading system for providing automatic readout by interrogation equipment located remotely from the meters having the capability of providing demand meter reading including the KWH reading and the demand meter reading for billing purposes regardless of the time of readout of the demand meter reading. Word generator generates words for transmission by an associated transponder in response to an interrogation signal from the remote source.

3,747,069
INTERVIEWING MACHINES AND METHOD

Philip I. Hershberg, 43 Harris Ave., Needham, Mass.

Filed Dec. 9, 1970, Ser. No. 96,327
Int. Cl. G06f 3/16; G09b 7/04
U.S. Cl. 340—172.5 3 Claims

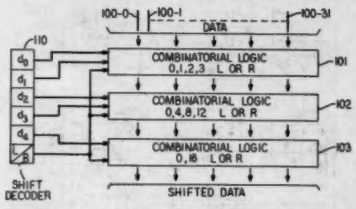


This invention is directed to a method and apparatus for automatically conducting an interview and recording responses elicited from the person interviewed. The apparatus includes means for controlling a magnetic tape recorder which presents questions in both a pre-determined and ordered fashion. The apparatus also includes means for recognizing and attempting to rectify improper responses at or shortly after the time that they are elicited. In addition, means are also provided for interpreting the resulting tape for automatic data entry into a keypunch machine, keytape recorder, data terminal, magnetic tape typewriter, computer or similar data entry or storage device.

3,747,070
DATA FIELD TRANSFER AND MODIFICATION APPARATUS

John Harry Huttenhoff, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1971, Ser. No. 211,012
Int. Cl. G11c 19/00; G06f 7/00
U.S. Cl. 340—172.5 5 Claims

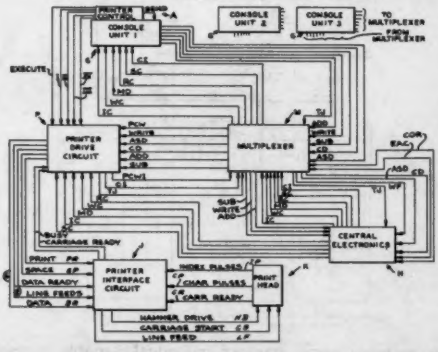


Apparatus for transferring a field of digital data in parallel from one position in an input data word to a different position in an output word is disclosed. A plurality of cascaded stages are used to achieve a required shifting; partial shifting occurs as an input word proceeds through each stage. Means are also provided to modify the content (as well as position) of an input word. By suitably combining redundant data paths, the logic connections in each stage are reduced.

3,747,071
ELECTRONIC DATA PROCESSING SYSTEM

Benjamin O. Haynes, St. Louis, Mo., assignor to Mylee Digital Sciences, Inc., Maryland Heights, Mo.

Filed May 10, 1971, Ser. No. 141,913
Int. Cl. G06f 15/02, 15/40
U.S. Cl. 340—172.5 40 Claims

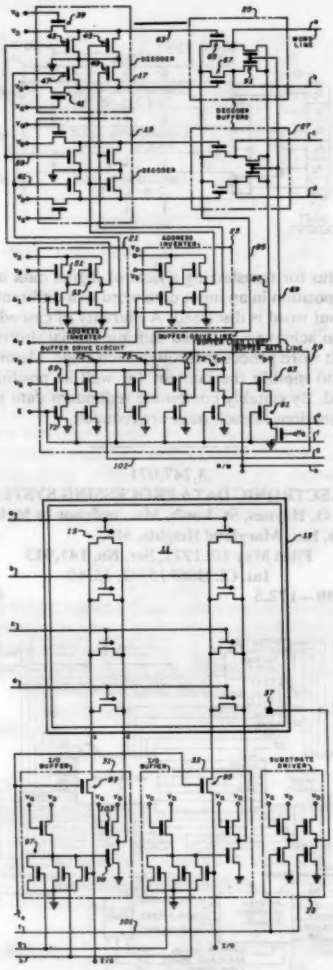


A data storage and retrieval system capable of performing various arithmetic functions such as adding and subtracting and for enabling a printing of any of the information and/or functions which take place in the system. The system includes one or more console units which may be remote or proximate to and connected to a central electronics unit through a multiplexer. The central electronics unit contains a memory section in the form of a magnetic storage member for retaining the information introduced into the system. At least one of the console units is provided with a printer control for controlling the mode of operation of a printing mechanism and the printer control of this one console unit is connected to a printer drive circuit. In like manner, the multiplexer and the central electronics unit are connected to the printer drive circuit. The output of the printer drive circuit is connected to a printer interface circuit which, in turn, enable operative connection to the printing mechanism.

3,747,072
INTEGRATED STATIC MNOS MEMORY CIRCUIT

Robert J. Lodi, Tewksbury, and Horst A. R. Wegener, Carlisle, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,260
Int. Cl. G11c 11/40, 5/02
U.S. Cl. 340—172.5 6 Claims

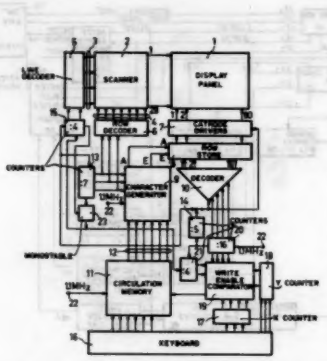


A memory array employs individual variable threshold MNOS transistors as memory cells. A decoder employs a binary coded address signal to select a desired word in the memory. A decoder buffer translates the output of the decoder into the true or complement of the output signal of the buffer and places the resulting signal on the gate electrode of the variable threshold MNOS transistors constituting a given word line. A READ/WRITE contact receives a signal that determines the mode of operation of the memory. An input/output buffer at the end of each bit line in the memory array converts an input signal into an inhibit or WRITE signal in response to a control signal passed through a control section when the READ/WRITE circuit receives a signal suitable for switching the memory into the WRITE mode. If the signal on the READ/WRITE contact has switched the circuit into the READ mode, the input/output buffer serves to gate output current to exterior circuits. The control section also provides suitable substrate voltages to the memory array.

3,747,073
ELECTRICAL DISPLAY DEVICES

Graham Trevor Sharpless, Burgess Hill, Sussex, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1972, Ser. No. 235,351
Claims priority, application Great Britain, Mar. 24, 1971, 7,754/71
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 12 Claims



An addressing circuit arrangement for an electrical display device comprising a two-dimensional matrix of light-emitting elements which are connected at respective crosspoints formed by two groups of row and column conductors and each of which can be illuminated selectively by suitable energizing signals applied contemporaneously to the two conductors, one in each group, between which the element is connected. The arrangement includes, a circulation memory for storing character data in respect of a plurality of lines of characters to be displayed and for supplying in turn the character data for each line of characters serially character by character in a recurrent cycle, a character generator which is responsive to the supplied data for each character to produce a group of coded electrical signals that determine the discrete parts of the character to be displayed in the row of elements concerned, and a row store for storing in each fill period of each row period the several groups of coded electrical signals for the whole of the row of elements concerned.

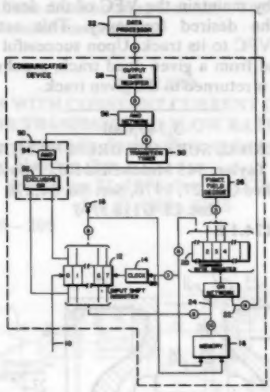
3,747,074
METHOD OF AND APPARATUS FOR BAUD RATE DETECTION

Fritz H. Schulze, St. Paul, Minn., assignor to Comteu, St. Paul, Minn.

Filed Mar. 17, 1972, Ser. No. 235,568
Int. Cl. G06f 3/04; H04j 3/00
U.S. Cl. 340—172.5 11 Claims

A communication system with baud rate detection capability. In a preferred embodiment of the system, the system includes a processor, a plurality of terminals, and a communication device for coordinating transmission of communications between the processor and terminals at a variety of baud rates. Each baud rate of a system corresponds to a unique baud-rate-code and each baud-rate-code is an interval of time. The signal by which each communication is transmitted includes a baud-rate-code as represented by at least one time interval between signal state transitions The communication device detects the signal state transitions representative of the baud-rate-code and concurrently records the time of occurrence of each detected transition. From a pair of recorded times, a transition interval is computed and correlated with one of the

baud-rate-code time intervals to identify a correlated baud-rate-code. The baud rate corresponding to the correlated baud-rate-code is indicated and a transmission of a communication is decoded in accordance with the indicated rate.

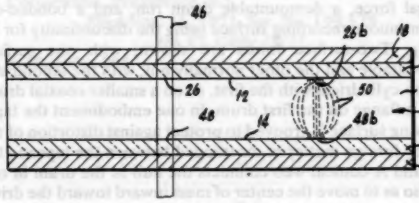


3,747,075

ELECTRO-OPTICAL STORAGE DEVICE

Scott Allen Keneman, Hightstown, and George William Taylor, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,397
Int. Cl. G11c *11/22*
U.S. Cl. 340—173 LT **6 Claims**



An electro-optical material body has two opposed surfaces, each covered with a transparent photoconductive material layer covered, in turn, with a transparent conductive electrode. Although not necessary, in a preferred method of operation, information is written into the body using light which is directed onto the body surfaces at an angle of inclination which is the same as that used with the light used to read information from the device. In a different embodiment, one surface of the body is covered by a transparent photoconductive material layer covered, in turn, by a transparent electrode, while the other surface of the body has a plurality of spaced electrodes thereon.

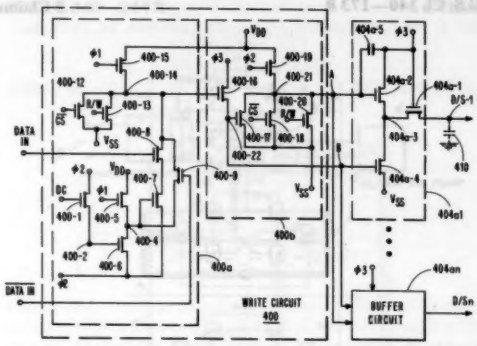
3,747,076

MEMORY WRITE CIRCUIT

William L. Martino, Jr., Lowell, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 3, 1972, Ser. No. 215,977
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **23 Claims**

A MOS write circuit includes circuits which are operative during a first interval of a memory cycle of a storage unit to store a predetermined signal to represent a result. During another interval, the circuits logically combine binary information signals applied thereto by the storage unit and a utilization device. In accordance with the result of logically combining the information signals, the circuit selectively modifies the state of a signal representation of the result stored during the first interval. The write circuit further includes output circuits which are rendered operative conditionally by external command signals from the device to switch state during another interval of the same memory cycle in accordance with the stored result as modified, producing complementary output signals representative of either binary ONE or binary ZERO information.

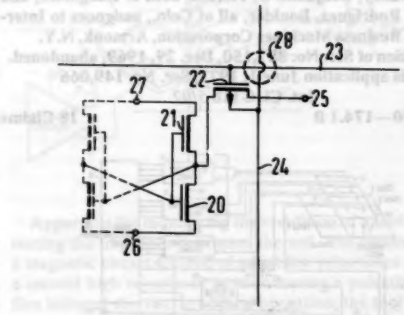


3,747,077

SEMICONDUCTOR MEMORY

Karl Goser, Muenchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 2, 1972, Ser. No. 222,770
Claims priority, application Germany, Feb. 11, 1971, P 21 06 579.2
Int. Cl. G11c *11/40*; H03r *3/286*
U.S. Cl. 340—173 R **11 Claims**



An integrated semiconductor memory with storage elements in a circuit employing a flip flop with field-effect selective transistors and with an arrangement based on the two or multiple coincidence principle, with corresponding control lines.

3,747,078

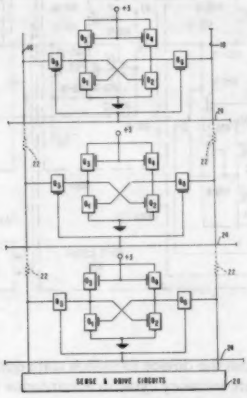
COMPENSATION TECHNIQUE FOR VARIATIONS IN BIT LINE IMPEDANCE

Jonathan W. Rose, Saunderstown, R.I., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1972, Ser. No. 266,860

Int. Cl. G11c *11/40, 13/00*

U.S. Cl. 340—173 R **9 Claims**



This specification describes a compensation technique for use with storage cells coupled at different points along a resistive sense line to a common sense amplifier so that the position along the sense line effects the impedance between the storage cell and the sense amplifier. The compensation technique involves varying the impedance of a device for coupling and uncoupling the storage element of each cell to the bit line. Where the impedance between the storage cell and the sense amplifier is small the coupling device's impedance is made large and where the impedance between the device and the sensing circuits is large the device's impedance is made small. More particularly, the element coupling the cell to the line is a field effect transistor whose length is made longer and shorter to vary its impedance and thereby compensate for impedance differences along the sense line between the storage cell and the sense amplifier.

3,747,079

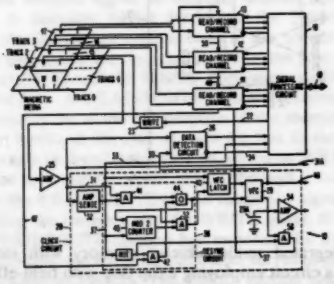
REDUCING DEAD-TRACKING IN RECORDING SYSTEMS

David L. Bailey; Benjamin C. Fiorino, both of Longmont, and Juan A. Rodriguez, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 887,150, Dec. 29, 1969, abandoned. This application June 1, 1971, Ser. No. 149,066

Int. Cl. G11b *5/02*

U.S. Cl. 340—174.1 B **18 Claims**



A self-clocking magnetic recording system, such as a magnetic tape system, is subject to dead tracking (i.e., loss of signals from a track on the media). During dead-tracking, the variable frequency clock VFC) associated with the dead track is synchronized to the data frequency of an adjacent operating track to thereby maintain the VFC of the dead track at approximately the desired frequency. This action enables resyncing the VFC to its track. Upon successful detection of data being read from a given dead track, synchronization of the given VFC is returned to the given track.

3,747,080

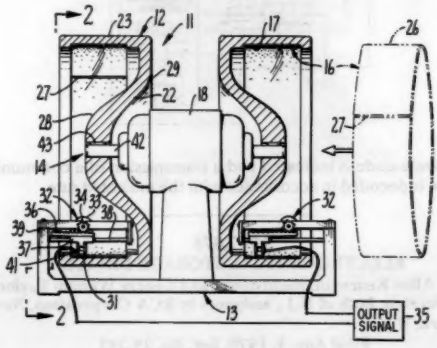
INTERNAL SURFACE DRUM MEMORY

Nathan Eldred Taylor, 345 Middlefield Rd., Palo Alto, Calif.

Filed Oct. 27, 1970, Ser. No. 84,270

Int. Cl. G11b *5/78*

U.S. Cl. 340—174.1 E **13 Claims**



A magnetic drum recording system using the inner surface of a revolving drum to bear the recording medium. Forms shown include a removable tape strip held in place by centrifugal force, a demountable drum rim, and a bonded-on, discontinuous recording surface using the discontinuity for indexing. Two-surface forms are shown, with one surface demountable and the other normally not, with the second surface co-cylindrical with the first, or on a smaller coaxial drum, or on a flange on the first drum. In one embodiment the tape-receiving surface is grooved to protect against distortion of the tape by foreign matter or air trapped between the tapeand the tape and A conical web connects the hub to the drum in one form so as to move the center of mass inward toward the drive, and an air-cushioned "flying" record/playback head is shown.

3,747,081

MAGNETIC DRUM HEAD MOUNT

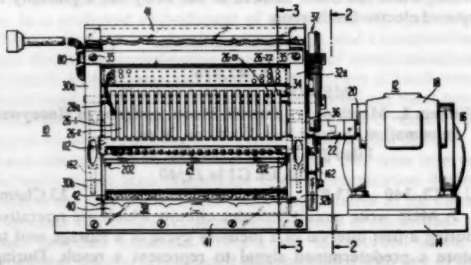
James Power Watson, Palm Beach Gardens, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 26, 1971, Ser. No. 202,343

Claims priority, application Great Britain, Aug. 6, 1971, 37,099/71

Int. Cl. G11b *5/54*

U.S. Cl. 340—174.1 C **12 Claims**



A magnetic drum has a plurality of record-reproduce heads along its surface. A common shaft having pins at precisely

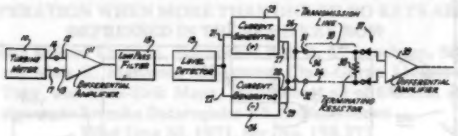
spaced intervals serves both to hold the heads in registration and to lift them from the surface of the drum. The device is journaled in bearings which serve as doweling to position split-end plates of the drum housing assembly. The drum is removable to permit interchangeability.

3,747,082

SYSTEMS WITH CONSTANT CURRENT GENERATORS FOR TRANSMITTING FLOW RATE DATA

Sidney Allan Ottenstein, Spring, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Aug. 23, 1971, Ser. No. 173,992
Int. Cl. G08c 19/16
U.S. Cl. 340—205 5 Claims



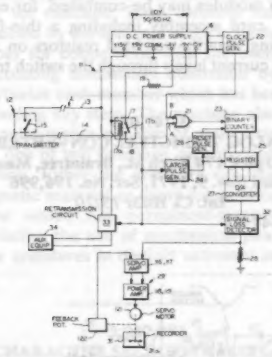
System and method for transmitting a pulsating signal from a pipeline flowmeter to a station located remotely of the flowmeter. The pulsating flowmeter signal is converted to current pulses of constant magnitude, and these pulses are passed along a transmission line to the remotely located station where the line is terminated in a resistive load.

3,747,083

TELEMETRIC RECEIVER

Pasco A. Coia, Providence, R.I., assignor to General Signal Corporation, Providence, R.I.

Filed Nov. 16, 1971, Ser. No. 199,178
Int. Cl. G08c 19/22
U.S. Cl. 340—206 17 Claims



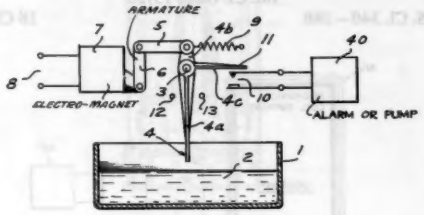
The disclosure concerns a telemetric receiver for pulse width modulated signals. The receiver processes the transmitted signal by transducing it into a series of clock pulses, counting the pulses in the binary number system, then transferring the count to a memory register, and finally converting the stored count into an analog current which develops an input for a DC positioner which actuates a readout element. Preferably, the transmitted signal is introduced through a line isolation relay, and the receiver includes apparatus for retransmitting the incoming signal, and a signal loss detector which sets the analog current to a prescribed level whenever the transmission lines are shorted or broken or the duration of the transmitted signal is intentionally reduced to zero.

3,747,084

LIQUID LEVEL GAUGE

Winfried Hartung, Offenbach, Germany, assignor to Roland Offsetmaschienfabrik Faber & Schleicher AG, Offenbach am Main, Germany

Filed Mar. 11, 1971, Ser. No. 123,196
Int. Cl. G08b 21/00
U.S. Cl. 340—244 R 6 Claims



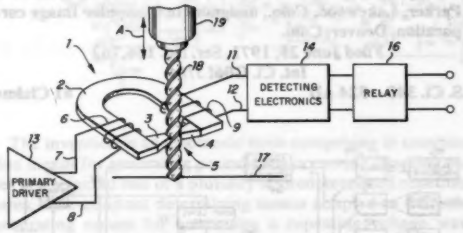
A liquid level gauge for supervising the level of a liquid such as the level in an ink receptacle of a printing press comprises a probe which is driven to perform repetitive uniform motions and so arranged that it dips into the ink when the level thereof exceeds a predetermined height. Dipping of the probe into the ink and the resulting increased resistance thus experienced by the probe cause the probe to vary the repeat pattern of its motions. This variation is utilized via switch means controlled by the probe motions to stop the feeding of ink into the receptacle thereby effectively preventing over-filling of the ink receptacle.

3,747,085

TOOL MONITORING APPARATUS

John L. Bala, Stow, and Peter W. Ford, Winchester, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Nov. 3, 1971, Ser. No. 195,397
Int. Cl. G08b 21/00
U.S. Cl. 340—267 R 8 Claims



Apparatus for monitoring the condition of a tool and for detecting the improper operation thereof. The apparatus utilizes a magnetic circuit formed of a first low reluctance portion and a second high reluctance portion having a pulsating magnetic flux induced therein. In normal operation, the tool to be monitored is adapted to be positioned within and substantially bridge the high reluctance portion, which preferably comprises an air gap, and become a part of the circuit thus greatly lowering its reluctance. Appropriate electronics are provided to monitor abrupt and significant increases in the reluctance due to withdrawal of the tool from the air gap caused by breakage or loss of the tool. The sensing portion of the apparatus is manufactured as an enclosed unit which may be adapted to monitor tools of various types and sizes.

3,747,086

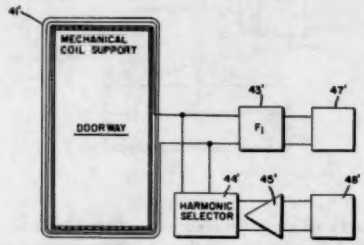
DEACTIVATABLE FERROMAGNETIC MARKER FOR DETECTION OF OBJECTS HAVING MARKER SECURED THERETO AND METHOD AND SYSTEM OF USING SAME

Glen Peterson, Tulsa, Okla., assignor to Shoplifter International, Inc., Carrollton, Tex.

Division of Ser. No. 747,050, March 22, 1968, Pat. No. 3,631,442, which is a continuation-in-part of Ser. No. 680,666, Nov. 6, 1967, abandoned. This application Nov. 24, 1971, Ser. No. 201,687

Int. Cl. G08b *13/26*

U.S. Cl. 340—280 18 Claims



A deactivatable ferromagnetic marker useful in tagging objects to allow selective detection of tagged objects depending upon the activation state of the marker. The marker comprises a plurality of ferromagnetic elements including a first element capable of generating a signal containing harmonics of an exciting oscillatory interrogating field and a second element having a coercive force greater than the first element and capable of retaining a state of magnetization when exposed to the interrogation field, such that when so magnetized a magnetic bias is imposed on the first element to prevent the generation of the harmonic signal. The system includes the marker attached to selected objects, an interrogation field, detection means, and deactivation means wherein the second element becomes magnetized.

3,747,087

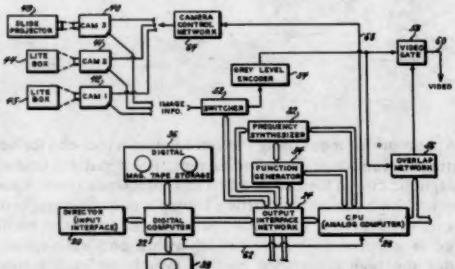
DIGITALLY CONTROLLED COMPUTER ANIMATION GENERATING SYSTEM

Lee Harrison, III, Camarillo, Calif.; Francis J. Honey; Edwin J. Tajchman, both of Denver, Colo., and Marshall M. Parker, Lakewood, Colo., assignors to Computer Image corporation, Denver, Colo.

Filed June 25, 1971, Ser. No. 156,762

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 AD 41 Claims



This invention relates to a system for automatically producing an animation sequence and includes an analog portion for generating output signals representing one or more sections of a raster on which images viewed by a video camera can be produced. Analog inputs to the analog portion define the parameters of the raster sections to effectively define the shape of each part of the viewed image produced thereon. The analog inputs to the analog portion are digitally controlled by signals from a digital computer portion which establishes these digital control signals from information fed to it from a director or a recording means.

3,747,088

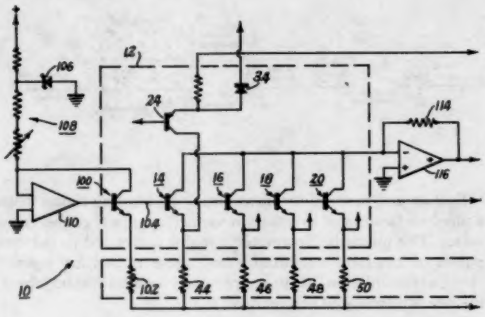
SOLID STATE DIGITAL-TO-ANALOG CONVERTER

James J. Pastoriza, Cambridge, Mass., assignor to Analog Devices Inc., Cambridge, Mass.

Filed Dec. 30, 1970, Ser. No. 102,854

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 DA 21 Claims



A digital-to-analog converter comprising an IC switch module providing four switch transistors and associated switch-control buffering circuitry. The emitter areas of the switch transistors are binarily weighted to provide equal current densities. The IC substrate also is formed with a fifth transistor to serve as a reference transistor for adjusting the supply voltage as necessary to maintain constant current through the switch transistors. To construct a digital-to-analog converter having a high bit resolution, a number of such "quad" switch modules may be combined, for example in a printed circuit card assembly including a thin-film resistor module providing binarily-weighted resistors on a glass substrate to set the current levels through the switch transistors.

3,747,089

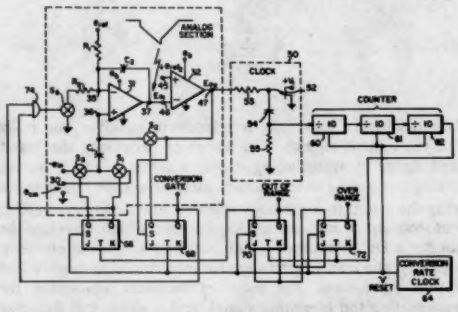
ANALOG TO DIGITAL CONVERTER

Kenneth R. Sharples, 174 Birch St., Braintree, Mass.

Filed Nov. 9, 1971, Ser. No. 196,996

Int. Cl. H03r *13/20*

U.S. Cl. 340—347 NT 15 Claims



An analog to digital converter of the dual slope type, employing a high gain input amplifier as both a buffer and in-

tegrator and a second high gain amplifier as a comparator. The input voltage is coupled to the non-inverting input terminal of the integrator through a capacitor. A programmed switching circuit provides for switching of the coupling capacitor either to the input voltage or to an input common terminal and also provides for opening and closing a direct feedback loop from the comparator output and for switching the second input terminal of the integrating amplifier between a reference level and ground. The converter operates to charge the integrator capacitor for a fixed time at a rate proportional to the input voltage and then to discharge this capacitor at a rate proportional to the reference voltage, while a counter accumulates time base pulses, until the capacitor reaches its initial level, the accumulated counts being a digital representation of the input voltage.

3,747,090

COUNTING MACHINE HAVING MEANS TO PREVENT OPERATION WHEN MORE THAN ONE OR NO KEYS ARE DEPRESSED IN THE SAME KEY ROW

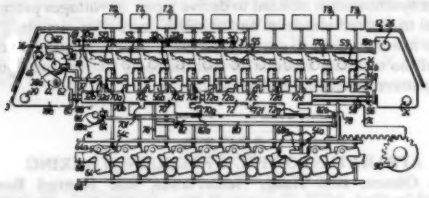
Gosta Roland Englund, Stockholm; Rolf B. G. Israelsson, Solna; Mats E. Mattsson, Sollentuna; Claes-Goran Lindelow, Taby, and Sven-Erik Maxe, Jakobsberg, all of Sweden, assignors to Svenska Dataregister AB, Solna, Sweden

Filed June 30, 1971, Ser. No. 158,273

Claims priority, application Sweden, July 3, 1970, 9274/70

Int. Cl. H04q *3/00*

U.S. Cl. 340—365 R **21 Claims**



A business machine data entering and checking system in which a solenoid, is provided for each digit position in the keyboard of the machine. Each solenoid has an armature which is attracted by the solenoid when activated and thereby sets a member for cooperation with the corresponding key stem. An actuating mechanism controlled by the machine thereafter actuates each member which has been set to affect the corresponding key stem. The machine also includes permanent-magnetic means capable of maintaining each armature in each one of two positions, an activated and an unactivated position. Either the armature can consist of a permanent-magnetic material or every solenoid can be provided with a core which has permanent-magnetic properties, thereby obviating the use of mechanical pawls arranged to maintain the armatures in distinct activated and unactivated positions.

3,747,091

MULTI-CHARACTER SELECTIVE DISPLAY DEVICE

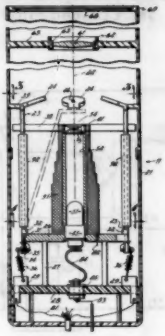
Warren D. Novak, 325 Douglas Rd., Chappaqua, N.Y.

Filed Dec. 16, 1971, Ser. No. 208,640

Int. Cl. G09f *11/34*

U.S. Cl. 340—378 B **17 Claims**

A device for selectively displaying one of a plurality of characters at a viewing axis and which is particularly useful for selectively displaying decimal digits representative of numerical values in response to digital electrical signals. The device includes ten pivotal arms spaced in a circle and normally biased outwardly and maintained parallel to a central viewing axis. The free ends of the arms have transparent indicia embedded therein. The arms are selectively pivotable to move their free ends onto the viewing axis to present the indicia for display. The central axis includes means for projecting collimated light through the transparent indicia on the free ends of the levers to project images of the indicia upon a viewing



screen. Movement of the selected lever is achieved by novel means which selectively magnetize a core surrounding the central axis and the selected one of the arms to magnetically attract its indicia bearing end onto the viewing axis.

3,747,092

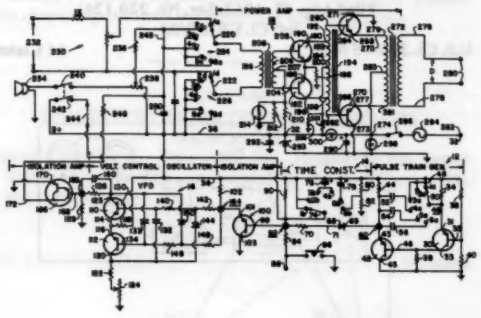
ELECTRONIC SIREN CIRCUIT

Gerald D. Smith, Indianapolis, Ind., assignor to Carson Manufacturing Company, Inc., Indianapolis, Ind.

Filed Dec. 7, 1971, Ser. No. 205,624

Int. Cl. H04q *3/10*

U.S. Cl. 340—384 E **25 Claims**

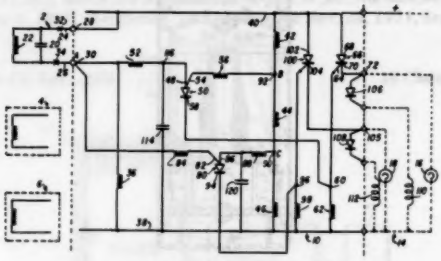


The invention is an electronic siren comprising in combination means for generating periodically occurring charging pulses at a selected one of a plurality of predetermined repetition rates, time-constant determining means coupled to the pulse generating means for generating a repeating voltage wave form in response to the charging pulses and means coupled to the time-constant determining means for generating a square wave signal having a frequency proportional to the instantaneous voltage of the voltage wave form. Coupled to the square wave generator is an output circuit which includes a first pair of transistors and first circuit means coupling the transistors to the square wave generator for driving the first pair of transistors individually and alternately into saturation in response to the aforementioned square wave signal. There are also provided a second pair of transistors and second circuit means coupling the second pair of transistors to the first pair of transistors for driving the second pair of transistors individually and alternately into saturation in synchronism with saturation of the first pair of transistors.

3,747,093
ALARM CIRCUIT

Gorur Ramaswmiengar Ranganath, Springfield, Mass., assignor to Standard Electric Time Corporation, Springfield, Mass.

Filed Nov. 19, 1971, Ser. No. 200,365
Int. Cl. G08b 23/00
U.S. Cl. 340—409 5 Claims

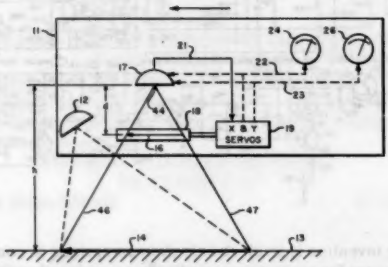


A solid state circuit for indicating that an alarm condition exists at a remote location or that an interruption in the electrical connections to the remote location has occurred. The circuit includes a normally-open contact at the remote location connected in circuit with a resistor bridge circuit at a control location, closure of the contact causing a voltage unbalance in the bridge circuit to cause a programmable unijunction transistor to switch to a conducting state and operate an alarm lamp.

3,747,094
CORRELATOR

George R. Gamertsfelder, Pleasantville, N.Y., assignor to Singer Company, New York, N.Y.

Filed Aug. 27, 1962, Ser. No. 220,126
Int. Cl. G01s 9/00
U.S. Cl. 343—5 MM 11 Claims



1. A correlator for measuring the relative position of two objects by means of radiant energy comprising,

an object emitting radiant energy,

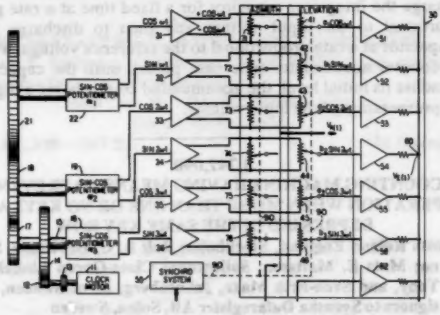
another object constituting a planar replica thereof positioned at a first selected distance from said object,

a detector for detecting radiated energy, said detector including a planar sensing area positioned at a second selected distance from said replica, said replica being smaller than said object in the ratio of said second distance to the sum of said first and second distances, said replica including means directing said emitted radiant energy toward said detector whereby a correlation pattern of radiation intensity is applied to said planar sensing area, the distance of the center of said correlation pattern from the center of the planar sensing area being a measure of the miscorrelation of said replica with said object.

3,747,095
SYNCHRONOUS SATELLITE TRACKING SYSTEM

Robert Woodrow Wilson, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1970, Ser. No. 81,792
Int. Cl. G01s 9/02
U.S. Cl. 343—7.4 9 Claims

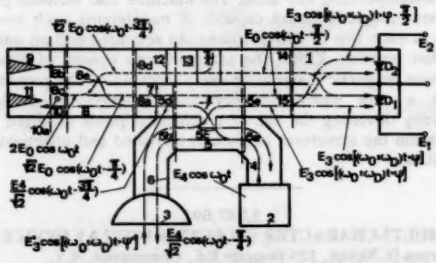


A synchronous earth satellite typically describes a figure "8" pattern because the plane of its orbit is generally inclined and/or elliptical. To satisfactorily track this satellite motion, the Fourier components of the same in azimuth and elevation are calculated from the orbit parameters and a partial Fourier series synthesizer is utilized to derive a pair of voltages proportional to desired elevation and azimuth correction signals. The latter are then used to correct the original or normal positioning of the tracking antenna so that the same follows the figure "8" pattern described by the satellite.

3,747,096
APPARATUS FOR HIGH-FREQUENCY MIXING

Finn Olesen, Den Haag, Netherlands, and Konrad Benz, Woburn, Mass., assignors to Zellweger AG, Uster, Switzerland

Filed Sept. 20, 1971, Ser. No. 181,934
Claims priority, application Switzerland, Oct. 16, 1970, 15327/70
Int. Cl. G01s 9/44
U.S. Cl. 343—8 15 Claims

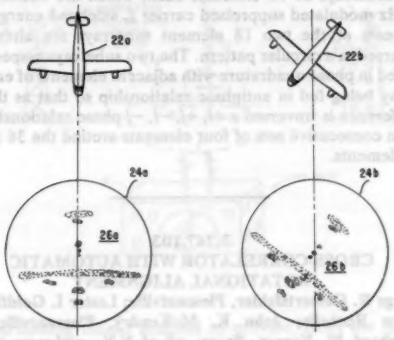


Apparatus for high-frequency mixing which contemplates mixing a first component of a received signal with a first component of a reference signal and a second component of the received signal with a second component of the reference signal, and wherein between the first and second component of the received signal, or the first and second component of the reference signal, or both, there prevails an at least approximately frequency-independent phase difference throughout a given frequency range.

3,747,097
RADAR TARGET IMAGING TECHNIQUE

Dean D. Howard, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1971, Ser. No. 118,541
Int. Cl. G01s 7/10
U.S. Cl. 343—11 R 8 Claims

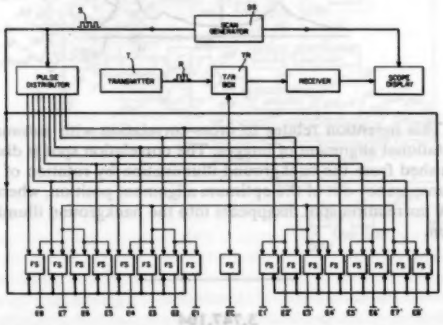


A radar which utilizes high resolution range techniques to obtain an indicator of the target that approaches a visual image presentation having more than one dimension. Specifically, the invention utilizes the radar high resolution range video return to control the input of a CRO, the Y location on the CRO trace being highly resolved range and the X location being bipolar azimuth video. This technique greatly enhances the radar's ability to avoid scintillation.

3,747,098
PHASED-ARRAY ANTENNA

George M. Kirkpatrick, and Norman R. Wild, both of North Syracuse, N.Y., assignors to Syracuse University Research Corporation, Syracuse, N.Y.

Filed July 23, 1970, Ser. No. 57,618
Int. Cl. H01q 3/26
U.S. Cl. 343—16 R 18 Claims

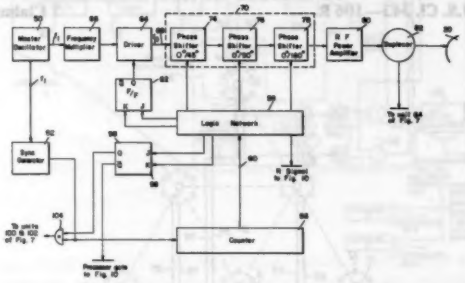


A phased-array radar antenna system has a scan pattern which is pivotal about the center of the array. The scan pattern is directed from a common set of scan-control circuitry which consists primarily of digital counters and logic whose output describe the settings of ON-OFF ferrite phase shifters for the elements on one side of the array. The one's complements of these outputs are used to control the settings for the other one-half of the array, without need for an extra least bit. Each phase shifter consists of four bits. When all four bits are in their ON state, a phase shift of 360° is obtained. The minimum or increment of phase shift is 24°.

3,747,099
POLYPHASE CODE SYSTEM

Sung Y. Wong, Tarzana, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 18, 1970, Ser. No. 73,471
Int. Cl. G01s 9/233
U.S. Cl. 343—17.2 PC 21 Claims

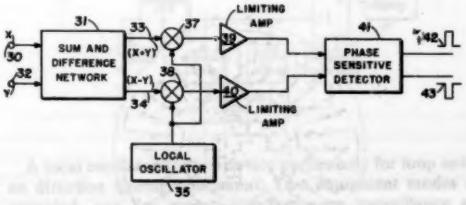


A system for polyphase encoding transmitted pulses of energy and for decoding the received signals to enhance returns from the range interval being examined during a particular processing period and attenuate returns from contiguous range intervals (pulse compression). The system includes a digital decoding unit, which for an N phase code of length N^2, comprises N processing subsections. The subsections are mechanized such that instead of individually phase shifting and adding each of the N^2 signals during each decoding sequence, the decoded value of a signal group being processed is formed by modifying and phase shifting only the N subsection output signals from the preceding decoding cycle.

3,747,100
APPARATUS FOR IDENTIFYING MAIN LOBE RESPONSES

Joseph F. Gulick, Jr., Clarksville, Md., assignor to The United States of America as represented by the Secretary of the Navy, D.C.

Filed July 30, 1970, Ser. No. 59,403
Int. Cl. G01s 3/06
U.S. Cl. 343—100 LE 6 Claims



Apparatus for instantaneously determining whether the angle of arrival of a signal is within an antenna main lobe or within a side lobe, which utilizes a high gain, highly directive antenna and a low gain, broad pattern antenna, in combination with a local oscillator, limiting amplifiers and a phase sensitive detector. The antennae are mounted so that their centers of radiation are coaxial and on a plane perpendicular to the axes of their respective main receiving lobes.

3,747,101
HIGH PERFORMANCE RADIO-NAVIGATION STATIONCUS

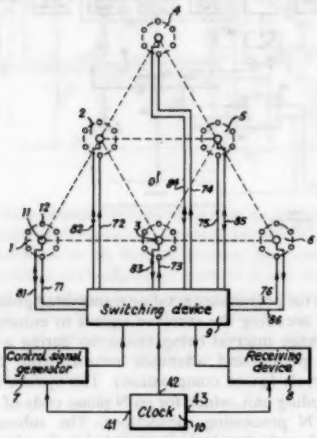
Henri G. Becavin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 30, 1971, Ser. No. 158,486

Claims priority, application France, July 17, 1970, 7026432; May 18, 1971, 7117978; July 17, 1970, 7026433; May 18, 1971, 7117979

Int. Cl. G01s 1/54

U.S. Cl. 343—106 R **7 Claims**



A radio-navigation station allowing, in particular, the introduction of a wide-base system in a pre-existing station with a single antenna radiating a rotating cardioid radiation pattern, without replacement of the transmitting and receiving equipment.

A plurality of such antennas are used each one being successively connected, for a predetermined duration, to the receiver in the case of a direction-finding station and to the transmitter in the case of a radio-beacon.

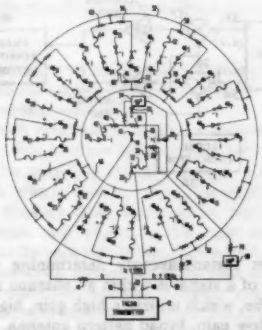
3,747,102
ELECTRONICALLY MODULATED TACAN ANTENNA

Herbert Warren Cooper, Hyattsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1971, Ser. No. 208,301

Int. Cl. G01s 1/46

U.S. Cl. 343—106 R **7 Claims**



A TACAN antenna array comprising a central radiating element, providing carrier frequency f_c radiation omnidirectionally in the azimuth plane, which is surrounded by two or more concentric arrays of 15Hz and 135Hz modulation radiating elements. The first concentric array is preferably comprised of 4 elements used to provide a $f_c \pm$ 15Hz modulation and is comprised of two orthogonally disposed antiphased subarrays which are excited with the suppressed carrier sideband energy of a 15Hz modulated carrier frequency f_c with the two orthogonally arranged subarrays being excited in phase quadrature with one another. The second concentric array is preferably comprised of 36 radiating elements divided into two subarrays of 18 elements each, which are excited with 135Hz modulated suppressed carrier f_c sideband energy. The elements of the two 18 element subarrays are alternately dispersed in a circular pattern. The two subarrays respectively are fed in phase quadrature with adjacent elements of each subarray being fed in antiphase relationship so that as the circumference is traversed a $+I$, $+j$, $-I$, $-j$ phase relationship exists in consecutive sets of four elements around the 36 radiating elements.

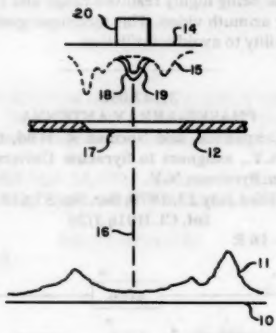
3,747,103
CROSS-CORRELATOR WITH AUTOMATIC ROTATIONAL ALIGNMENT

George R. Gamertsfelder, Pleasantville; Lester I. Goldfischer, New Rochelle; John K. McKendry, Pleasantville, and Richard M. Vesper, Bronx, all of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Apr. 22, 1963, Ser. No. 275,475

Int. Cl. H04b 7/00

U.S. Cl. 343—100 CL **6 Claims**



This invention relates to cross-correlation with automatic rotational alignment of images. The correlation spot is distinguished from the background illumination by rotation of the transparency out of the optimum alignment position, whereby the correlation spot disappears into the background illumination.

3,747,104
SUPERVISORY SYSTEM FOR DETECTION AND LOCATION OF CONTINGENCIES

Anthony J. Pansini, Waco, Tex., assignor to Long Island Lighting Company, Mineola, N.Y.

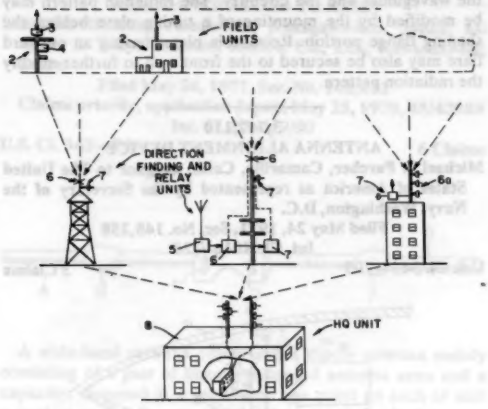
Continuation-in-part of Ser. No. 821,002, May 1, 1969, abandoned. This application Dec. 13, 1971, Ser. No. 207,013

Int. Cl. G01s 5/02

U.S. Cl. 343—112 R **10 Claims**

A plurality of self powered, normally silent alarm transmitters are coupled to respective checking points of a distribution network by means of contingency sensitive switches. A receiver continuously monitors the correlated network section

within the transmission range of a number of these transmitters to detect the presence of a signal and cooperates with a location finding means adapted to provide, from the received signal, information about location of the active transmitter in the network.

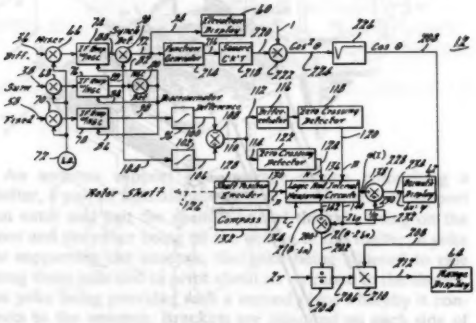


3,747,105

POSITION DETERMINING SYSTEM FOR HELICOPTERS

Delmar V. Payne, Ferndale, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 29, 1970, Ser. No. 76,411
Int. Cl. G01s 5/02
U.S. Cl. 343—112 R **32 Claims**



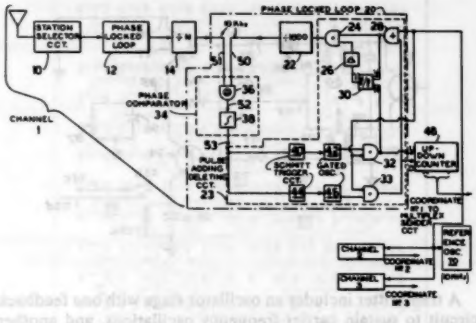
A system for determining the position of a helicopter with respect to a remote transmitting antenna using at least one receiving antenna mounted on a blade of the helicopter to superimpose a doppler shift on a signal received from the remote transmitting antenna. Preferably, the helicopter also has a fixed antenna to provide a reference frequency. The system detects the blade rotational intervals between maximum positive, maximum negative and zero doppler shift to determine the range and bearing of the remote antenna with compensation for errors caused by maneuver of the helicopter.

3,747,106

NAVIGATION SYSTEM UTILIZING PLURAL COMMERCIAL BROADCAST TRANSMISSIONS

Eli James Dalabakis, Seminole, and Harry Douglas Shearer, Petersburg, both of Fla., assignors to Electronic Communications, Inc., St. Petersburg, Fla.

Filed July 1, 1971, Ser. No. 158,860
Int. Cl. G01s 11/00
U.S. Cl. 343—112 D **7 Claims**



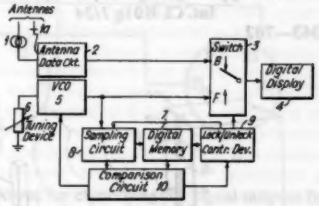
A radio navigation, position locating and signaling arrangement employs three operative channels for receiving three commercial radio transmissions. Each channel includes feedback circuitry for maintaining a constant phase relationship between a replica of the received broadcast carried and a reference oscillation, both reduced in frequency. An accumulator in each channel records the number of pulses added and/or deleted from the reference pulse train to provide a measure of the radial distance travelled by a vehicle with respect to the corresponding fixed radio transmitters. Position information may then be derived from the three radial measurements.

3,747,107

FREQUENCY LOCKING SYSTEM FOR DIRECTION FINDERS

Dag Poppe, Gjettum; Odd Mathiesen, Oslo, and Christian Fredrik Holmboe, Hosle, all of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 5, 1972, Ser. No. 250,519
Claims priority, application Norway, May 7, 1971, 1734/71
Int. Cl. G01s 3/04
U.S. Cl. 343—113 R **5 Claims**

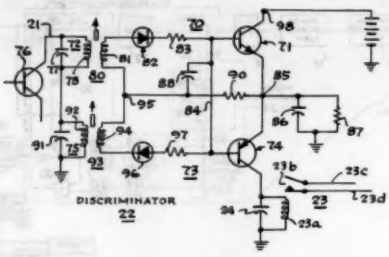


A local oscillator control device particularly for loop antenna direction finding equipment. Two equipment modes are provided, one for tuning and frequency surveillance and another for bearing determination, are provided. The local oscillator (LO) is manually controlled and also voltage controlled, the voltage control being imperative during tuning ("Frequency" mode) but operates to stabilize the LO when the "Bearing" (reading) mode is enabled, within predetermined limits. The circuits operate to revert the mode from "Bearing" to "Frequency" whenever the manual LO tuning is activated or a predetermined drift limit is exceeded.

3,747,108
REMOTE CONTROL SYSTEM

Kenneth M. Ringer, Longmont, Colo., assignor to A. R. F. Products, Incorporated, Raton, N. Mex.

Continuation of Ser. No. 840,806, July 10, 1969, which is a continuation-in-part of Ser. No. 749,746, Aug. 2, 1968. This application Sept. 7, 1971, Ser. No. 178,376
Int. Cl. H04b 7/00
U.S. Cl. 343—225 **30 Claims**

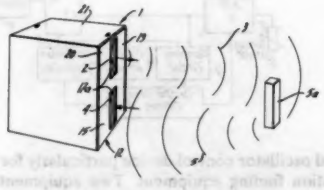


A transmitter includes an oscillator stage with one feedback circuit to sustain carrier-frequency oscillations, and another feedback circuit, in which a pair of capacitors are successively coupled across a transformer winding by a multivibrator circuit, to modulate the carrier signal between two different audio frequencies at a predetermined repetition rate. In a modified construction one of the tones can be changed to a third tone by switching an additional capacitor in parallel with one of the two capacitors. The receiver discriminator circuit includes a pair of frequency-selective channels for gating on a transistor in each channel. A capacitor is charged through the first transistor and discharged through the second to energize a relay winding if the alternation of transistor conduction is substantially at the predetermined repetition rate. The modified receiver construction includes a third frequency-selective channel, a third transistor, a second relay, and a diode gating circuit whereby the second relay is energized when the first and third tones are received.

3,747,109
WAVEGUIDE ANTENNA STRUCTURE FOR INTRUSION DETECTION APPARATUS

Paul I. Corbell, Dallas, Tex.; Alfred Giovanelli, Kenosha, and Lawrence B. Korta, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Continuation of Ser. No. 805,590, March 10, 1969, abandoned. This application Apr. 22, 1971, Ser. No. 136,570
Int. Cl. H01q 1/24
U.S. Cl. 343—702 **10 Claims**

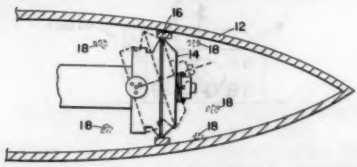


The disclosure includes an intrusion detection unit having a rectangular transmitting waveguide and a corresponding receiving waveguide mounted in stacked relationship within a U-shaped housing member. The forward ends of the waveguides are connected to the housing front wall which extends perpendicularly of the waveguide aperture and defines the energy pattern shaping flanges. The waveguides are mounted in vertically spaced relation and coupled by a coaxial line. A pair of printed circuit boards are secured to the outer sidewall of the stacked waveguides such that the waveguides form the chassis for the transmitter and receiver means. An outer cover telescopes over the housing member to enclose the waveguides and the circuitry. The radiation pattern may be modified by the mounting of a tuning plate behind the shaping flange portion. Releasable plates having an outward flare may also be secured to the front wall to further modify the radiation pattern.

3,747,110
ANTENNA ALIGNMENT DEVICE

Michael S. Parcher, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1971, Ser. No. 148,258
Int. Cl. H01q 1/28
U.S. Cl. 343—705 **3 Claims**

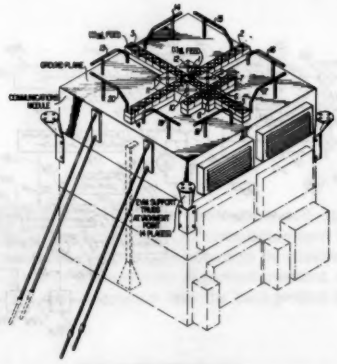


A ring-shaped frangible member for maintaining the movable internal antenna "dish" of a guided missile in a boresighted position and thus prevent it from becoming misaligned during storage and handling. When the missile is launched, movement of the antenna breaks up the ring so that it offers no interference with normal operation.

3,747,111
COMPOSITE ANTENNA FEED

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Vito Joseph Jakstys, Cupertino, Calif.

Filed Sept. 21, 1971, Ser. No. 182,399
Int. Cl. H01q 21/00
U.S. Cl. 343—725 **13 Claims**



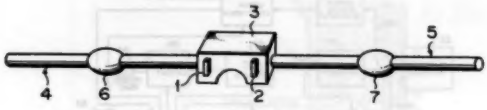
A composite antenna feed subsystem concentrated in a small area at the prime focus of the parabola of a satellite parabolic reflector accomodates a plurality of frequency bands. The arrays comprising the subsystem are mounted on the top cover of a communication module. A multimode horn is arranged at the center of the subsystem axis which functions at X- and C-band frequencies, and a cross-array consisting of individual elements form the S-band feed, with one arm of the S-band array containing an element mutually shared with the L-band array. Provision is also made for UHF frequencies, and a dipole arrangement for VHF frequencies is arranged around the S-band arms.

3,747,112

WIDE-BAND DIPOLE ANTENNA WITH CAPACITIVE REACTANCE ADDED TO ARMS

Kazutaka Hidaka, Yamato-shi, Kanagawa-ken, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 24, 1971, Ser. No. 146,412
Claims priority, application Japan, May 25, 1970, 45/43989
Int. Cl. H01q 9/00
U.S. Cl. 343—749 6 Claims



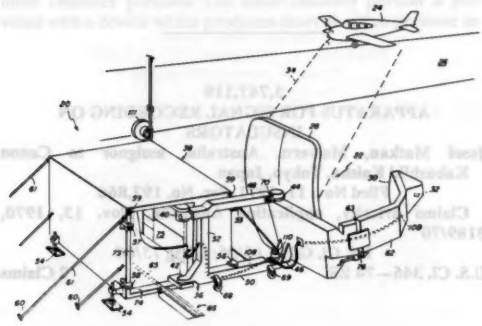
A wide-band antenna comprising a dipole antenna mainly consisting of a pair of linearly arranged antenna arms and a capacitor disposed at a prescribed one point on each of said paired arms equally spaced from the center of a feeding portion.

3,747,113

ANTENNA SUPPORT AND STOWAGE SYSTEM

Salvatore V. De Vellis, Bedford, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed May 31, 1972, Ser. No. 258,156
Int. Cl. H01q 3/00
U.S. Cl. 343—766 15 Claims



An antenna support and stowage device comprising a shelter, a pair of rails along which an antenna and its support can enter and exit the shelter, one of the rails being on the floor and the other being on the ceiling of the shelter, a yoke for supporting the antenna, the yoke being adapted to ride along these rails and to pivot about an entrance to the shelter, the yoke being provided with a second pivot whereby it connects to the antenna. Brackets are mounted on each side of the shelter entrance for pinning the frame to the brackets and rigidly supporting the antenna even in the presence of wind gusts. Motor driven pivots are provided for pivoting the antenna about the frame and the frame about the shelter.

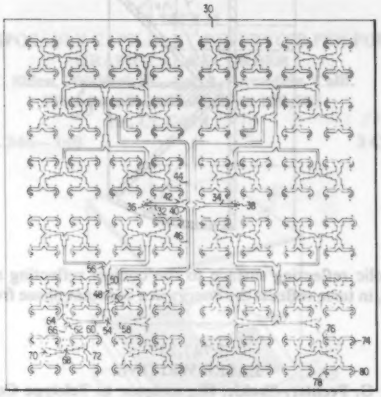
3,747,114

PLANAR DIPOLE ARRAY MOUNTED ON DIELECTRIC SUBSTRATE

Nicholas Shyhalla, Niagara Falls, N.Y., assignor to Textron Inc., Providence, R.I.

Filed Feb. 18, 1972, Ser. No. 227,541
Int. Cl. H01q 21/00
U.S. Cl. 343—795 4 Claims

An improved microwave antenna system employs a flat or planar array of radiating elements and, behind it, a distribution network of feeding circuit portions. The radiating elements and distribution network are physically separated by two wire connections and each feeding circuit portion terminates in a balun aligned with an associated dipole pair. The



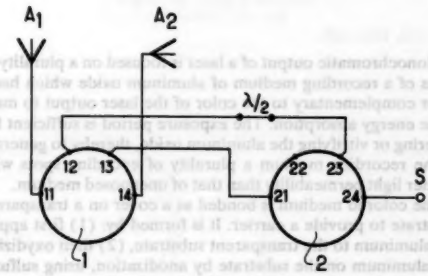
assembly includes a mounting frame and is of sandwich form incorporating frame portions therein so that the whole is an integral and rigid assembly. The antenna array is provided with a protective cover sheet arrangement and the frame circumscribes and covers the edges of the sandwich assembly.

3,747,115

CONNECTION SYSTEM FOR WAVES WITH VARIABLE POLARIZATION

Serge Canivenc, Perros-Guirec, France, assignor to Societe Lannionnaise D'Electronique, Lannion, France

Filed Sept. 14, 1971, Ser. No. 180,376
Int. Cl. H01q 9/16
U.S. Cl. 343—820 4 Claims



An arrangement for combining the signal outputs from two antennas with crossed planes of polarization furnishes a constant output level regardless of the direction of rotation of the polarization of the incident wave. It is applicable particularly to the reception of signals from satellites.

3,747,116

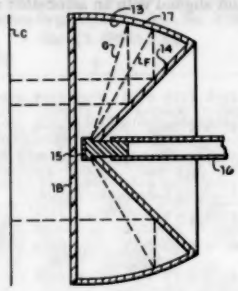
RADIATING CONE ANTENNA

Robert A. Milam, 4000 Marrison Pl., Indianapolis, Ind.

Filed Apr. 28, 1972, Ser. No. 248,706
Int. Cl. H01q 19/10
U.S. Cl. 343—837 5 Claims

A radiating cone antenna having a conical reflecting surface and a parabolic reflecting surface in spacial relationship and surrounding said conical reflecting surface. A linear directive

radiator is positioned at the focus of the parabolic reflecting surface and energy from the radiator is reflected from the

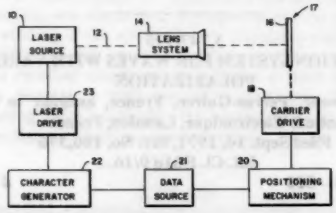


parabolic reflecting surface to the conical reflecting surface which, in turn, reflects the energy in a constant phase front.

3,747,117
LASER WRITING

Henry G. Fechter, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 31, 1971, Ser. No. 129,748
Int. Cl. G01d *15/34*
U.S. Cl. 346—1 **2 Claims**



Monochromatic output of a laser is focused on a plurality of areas of a recording medium of aluminum oxide which has a color complementary to the color of the laser output to maximize energy absorption. The exposure period is sufficient for sintering or vitrifying the aluminum oxide, thereby to generate in the recording medium a plurality of encoding spots with greater light permeability than that of unexposed medium.

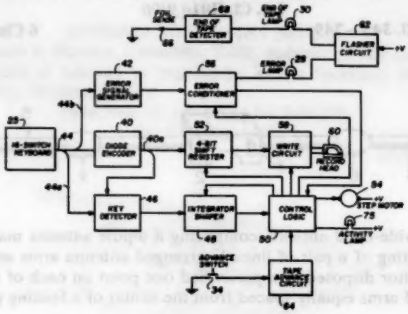
The colored medium is bonded as a cover on a transparent substrate to provide a carrier. It is formed by: (1) first applying aluminum to the transparent substrate, (2) then oxydizing the aluminum on the substrate by anodization, using sulfuric acid as electrolyte to spongify the aluminum oxide and thereby to maximize the dye absorptive property thereof, (3) thereafter, immersing the product in a dye solution for coloring the aluminum oxide, and (4) finally fixing the dye in the aluminum oxide.

3,747,118
PORTABLE MAGNETIC TAPE RECORDER HAVING MEANS FOR ELIMINATING SWITCH BOUNCE

William R. Guidi, Huntington, N.Y., assignor to Digital Technology Corporation, Hailsite, N.Y.

Filed Dec. 18, 1970, Ser. No. 99,374
Int. Cl. G08c *25/00*; G11b *15/00*
U.S. Cl. 346—74 M **5 Claims**

A portable recording device for recording data on magnetic tape which has manually operated make and break contact key switches. A transistorized detector circuit responds to a keying error constituting simultaneous operation of more than one key switch to actuate an error signal. The error condition prevents recording of any data until cleared by selective key operation. Integrated logic circuit means prevents storing and

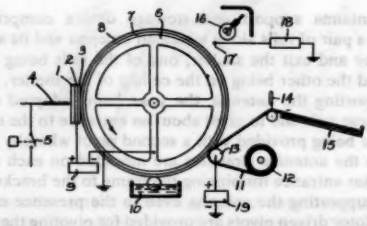


recording of data until spurious pulses generated by making and breaking key switch contacts are suppressed. A write circuit and dual recording head record data on two tracks simultaneously. An end of tape detector, a manually controlled advance circuit for the tape drive step motor, and an automatically actuated signal of low battery voltage are also provided.

3,747,119
APPARATUS FOR SIGNAL RECORDING ON INSULATORS

Josef Matkan, Malvern, Australia, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1971, Ser. No. 197,866
Claims priority, application Australia, Nov. 13, 1970, 3189/70
Int. Cl. G01d *15/06*; G03g *15/00*
U.S. Cl. 346—74 ES **2 Claims**



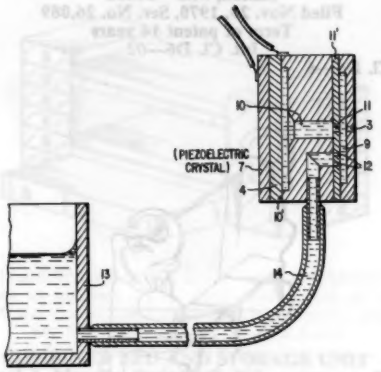
Apparatus for the recording of transmitted information in which an input signal is caused to illuminate a photoconductive control member in patterned form to produce a conductivity pattern in the control member which controls the deposition of electrostatic charge on the surface of a dielectric recording member in contact with the control member. A further photoconductive layer contained as a substrate on the dielectric recording member is used to discharge residual image charges on the dielectric recording member after the image has been developed and transferred.

3,747,120

ARRANGEMENT OF WRITING MECHANISMS FOR WRITING ON PAPER WITH A COLORED LIQUID

Nils Gustaf Erick Stemme, Prastgardsgatan 18, 41271 Goteborg, Sweden

Filed Jan. 10, 1972, Ser. No. 216,648
Claims priority, application Sweden, Jan. 11, 1971, 219/71
Int. Cl. G01d *15/16*
U.S. Cl. 346—75 19 Claims



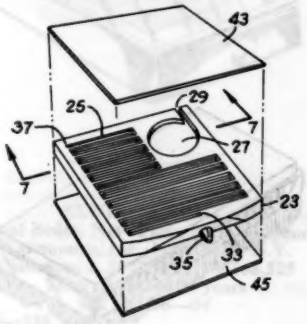
An arrangement for applying droplets of a substance in liquid form to a surface. The arrangement includes a chamber which is divided into an outer chamber portion and an inner chamber portion with a channel connecting the outer and inner chamber portions. The inner chamber portion is provided with a device which produces short duration pressure increases in the fluid in the chamber. The outer chamber portion is provided with at least one intake channel for the supply of liquid from a supply container and a discharge channel through which the liquid is discharged for deposition on the surface. The discharge channel and the connecting channel are arranged so that they are axially aligned.

3,747,121

DISPOSABLE CAPILLARY-RESERVOIR PEN FOR GRAPHICAL RECORDER

Terry C. Siden, 708 Park Pl., Apt. 4, Escondido, Calif.

Filed June 7, 1971, Ser. No. 150,468
Int. Cl. G01d *15/16*
U.S. Cl. 346—140 3 Claims

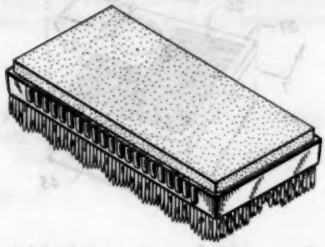


The pen for a graphical recorder contains ink in a sinuous capillary path having a predetermined hydraulic diameter. One embodiment of the pen includes priming means integral therewith.

DESIGNS

JULY 17, 1973

227,718
COMBINED BRUSH AND SPONGE
Jack W. Kaufman, 37—71 Junction Blvd., Jackson Heights, N.Y. 11372
Filed Feb. 11, 1972, Ser. No. 225,703
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—17

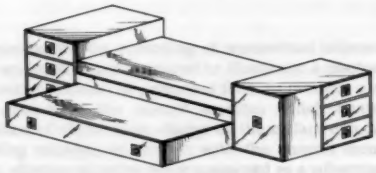


227,719
HEAD AND HANDLE FOR A TOOTHBRUSH
Per Lindbo, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed July 29, 1971, Ser. No. 167,538
Claims priority, application Norway Feb. 5, 1971
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

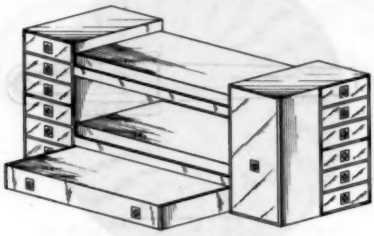
227,720
COMBINED SEAT AND CLOTHES SUPPORT BAR FOR A CHILD
Walter F. Rau, Sr., 211 Brookletts Ave., Easton, Md. 21601
Filed Nov. 20, 1970, Ser. No. 26,089
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—6

227,721
SECTIONAL SOFA
Howard I. Niederman, 3757 S. Ashland Ave., Chicago, Ill. 60609
Filed Jan. 3, 1972, Ser. No. 215,275
Term of patent 3½ years
Int. Cl. D6—*01*
U.S. Cl. D6—46

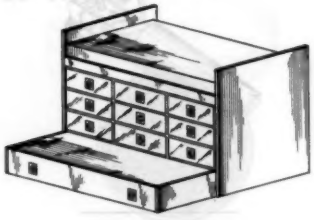
227,722
COMBINED BED AND STORAGE UNIT
Michael A. Mendlin, Springfield, N.J., assignor to Bunk Trunk Distributors, Paramus, N.J.
Filed July 6, 1971, Ser. No. 160,258
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



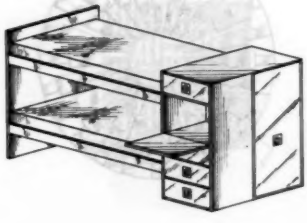
227,723
COMBINED BUNK BED AND STORAGE UNIT
Michael A. Mendlin, Springfield, N.J., assignor to Bunk Trunk Distributors, Paramus, N.J.
Filed July 6, 1971, Ser. No. 160,257
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



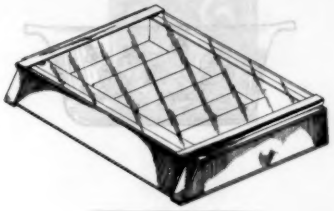
227,724
COMBINED BED AND STORAGE UNIT
Michael A. Mendlin, Springfield, N.J., assignor to Bunk Trunk Distributors, Paramus, N.J.
Filed July 6, 1971, Ser. No. 160,237
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



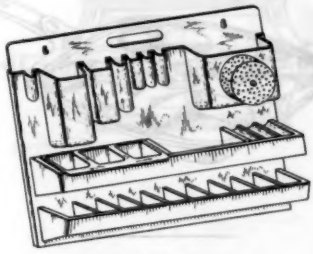
227,725
COMBINED BUNK BED AND STORAGE UNIT
Michael A. Mendlin, Springfield, N.J., assignor to Bunk Trunk Distributors, Paramus, N.J.
Filed July 6, 1971, Ser. No. 160,259
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80



227,726
DISPLAY CASE
Robert L. Sinclair, 14 Fairview Court, Dedham, Mass. 02026
Filed Oct. 1, 1971, Ser. No. 185,919
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172



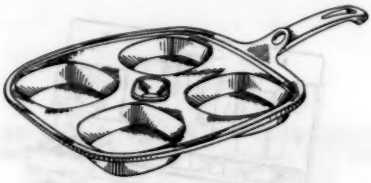
227,727
SEWING CADDY
Michael Beder, New York, N.Y., assignor to Wallmounts, Inc., New York, N.Y.
Filed Aug. 2, 1971, Ser. No. 168,525
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



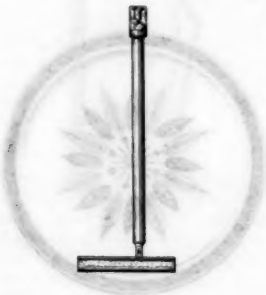
227,728
DINNER PLATE OR SIMILAR ARTICLE
Raymond T. Cleeland, Freehold, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed Aug. 13, 1971, Ser. No. 171,807
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35

227,729
SAUCEPAN OR THE LIKE
Patricia A. Luzier and Gregory Mirow, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Aug. 20, 1971, Ser. No. 173,737
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—97

227,730
EGG COOKER
Robert W. Shull, Cincinnati, and Ronald Thompson, Sidney, Ohio, assignors to General Housewares Corp., Terre Haute, Ind.
Filed Feb. 16, 1971, Ser. No. 115,917
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95



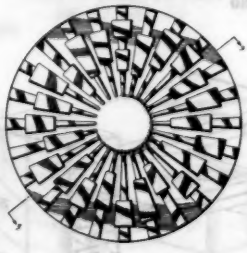
227,731
WINDSHIELD CLEANER
Charles W. Ball, 155 Ocean Ave., Bridgeport, Conn. 06605, and Alexander Brodsky, 153 Birch Road, Fairfield, Conn. 06430
Filed July 28, 1971, Ser. No. 167,084
Term of patent 14 years
Int. Cl. D4—*01*; D7—*05*
U.S. Cl. D7—183



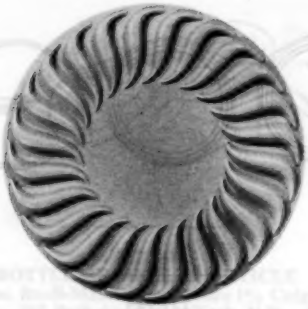
227,732
UTENSIL SCRAPER
Christopher J. Halpin and Christine E. Halpin, both of 2632 Wyndale Road, Toledo, Ohio 43613, and Eleanor K. Frisch, 3105 Navarre Ave., Oregon, Ohio 43616
Filed Sept. 20, 1971, Ser. No. 182,282
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—184

227,733
COMBINATION WHETTER AND SHEATH
Henry B. Baer, New York, N.Y., assignor to Imperial Knife Associated Companies, Inc., New York, N.Y.
Filed June 25, 1971, Ser. No. 157,084
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91

227,734
LOCK SET END PLATE
Nicholas Giandomenico, West Covina, Calif., assignor to Acme General Corporation, Monrovia, Calif.
Filed Jan. 25, 1971, Ser. No. 109,747
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138



227,735
LOCK SET END PLATE
Nicholas Giandomenico, West Covina, Calif., assignor to Acme General Corporation, Monrovia, Calif.
Filed Mar. 12, 1971, Ser. No. 123,933
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—139

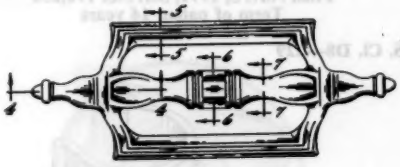


227,736
PULL
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 22, 1971, Ser. No. 211,160
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—144

227,737
PULL
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 22, 1971, Ser. No. 211,161
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—147

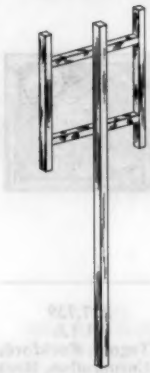
227,738
PULL
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed Dec. 22, 1971, Ser. No. 211,162
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—147

227,739
PULL
Raymond U. H. Tegner, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed July 7, 1972, Ser. No. 269,605
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—159

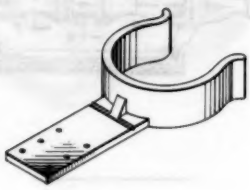


227,740
HINGE
Lee Richard Chasen, Port Chester, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.
Filed June 28, 1971, Ser. No. 157,789
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—189

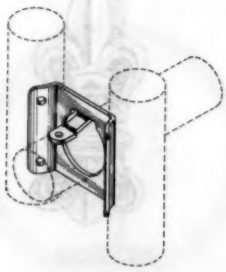
227,741
HOLDER FOR KITE STRING OR THE LIKE
Yangil Kim, 15 S. Idaho St., San Mateo, Calif. 94401
Filed Feb. 15, 1972, Ser. No. 226,645
Term of patent 14 years
Int. Cl. D8—*99;* D31
U.S. Cl. D8—220



227,742
FORM AND JOIST HANGER
Duane D. Logsdon, 1719 Canyon Road, Fullerton, Calif. 92631
Filed Nov. 5, 1971, Ser. No. 196,250
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—229

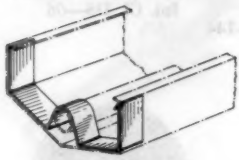


227,743
PERIMETER FENCE FITTING BRACKET
Michael S. Keegan, La Habra Heights, Calif., assignor to Master Fence Fittings, Inc., La Habra, Calif.
Filed May 11, 1972, Ser. No. 252,532
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—234

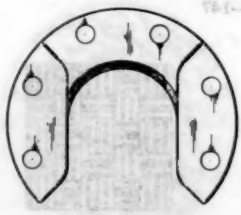


227,744
CONTAINER FOR PILLS OR THE LIKE
Walter Mitchko, 337 Elwood Road, East Northport, N.Y. 11731
Filed Mar. 25, 1971, Ser. No. 128,209
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235

227,745
TROUGH FEEDER PIPE CLAMP
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed June 21, 1972, Ser. No. 264,914
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—235

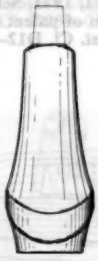


227,746
SPLIT BACK-UP FLANGE MEMBER
John K. Vitas, 11650 SW. Ridgeview Terrace, Beaverton, Oreg. 97005
Filed Aug. 25, 1971, Ser. No. 175,025
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—236



227,747
CHAIN PIECE
Tsurukichi Takagi, 1672 Takabayashi, Ohta, Gunma Prefecture, Japan
Filed Oct. 20, 1971, Ser. No. 191,156
Term of patent 14 years
Int. Cl. D11—*01*; D8—*05*
U.S. Cl. D8—261

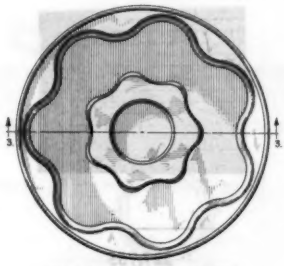
227,748
BOTTLE OR SIMILAR ARTICLE
Roger Riche, Rueil-Malmaison, France (% Colgate-Palmolive Co., 300 Park Ave., New York, N.Y. 10022)
Filed Apr. 28, 1972, Ser. No. 248,783
Claims priority, application France Jan. 31, 1972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—135



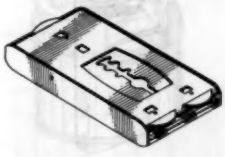
227,749
COMBINED DECANTER AND STOPPER
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 8, 1972, Ser. No. 233,015
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—139

227,750
BOTTLE
Morton Goldsholl, Highland Park, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Feb. 22, 1972, Ser. No. 228,441
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149

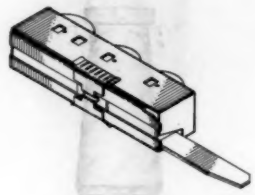
227,751
PACKAGING TRAY
Lorin M. Gardner, Northridge, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Oct. 6, 1971, Ser. No. 187,224
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



227,752
COMBINED RAZOR BLADE DISPENSER AND DATE INDICATOR
Gordon R. Muncy, 5061 Scott Circle, La Palma, Calif. 90620
Filed Feb. 22, 1972, Ser. No. 228,477
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

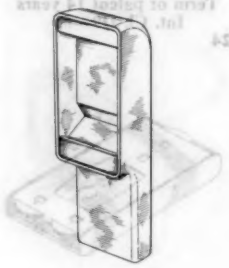


227,753
COMBINED RAZOR BLADE DISPENSER AND DATE INDICATOR
Gordon R. Muncy, 5061 Scott Circle, La Palma, Calif. 90620
Filed Feb. 22, 1972, Ser. No. 228,478
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224

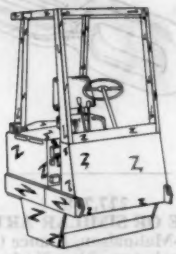


227,754
BUILDING PANEL OR THE LIKE
Truman L. Newberry, Jr., 6817 Candlewood Drive, Raleigh, N.C., and Samuel B. Ashford, 2671 Davis St., Raleigh, N.C. 27608
Filed Sept. 8, 1970, Ser. No. 24,872
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1 J

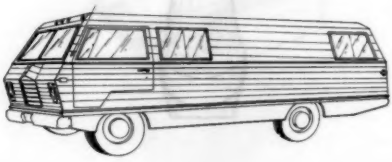
227,755
TELEPHONE KIOSK
Gerald J. Adamson, Scarborough, Ontario, and Jan W. Kuypers and Ian F. Norton, Toronto, Ontario, Canada, assignors to Don Mills Development Limited, Toronto, Ontario, Canada
Filed Nov. 11, 1971, Ser. No. 198,091
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 L



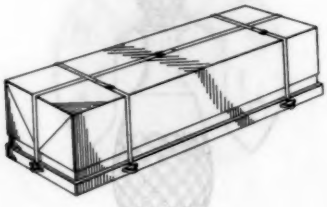
227,756
LIFT TRUCK BODY
William O. Smart, Peoria, and Kenneth Roncketti, Chicago, Ill., and Barry L. Zauss, Venice Beach, Calif., assignors to Towmotor Corporation, Cleveland, Ohio
Filed May 18, 1971, Ser. No. 145,120
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3 A



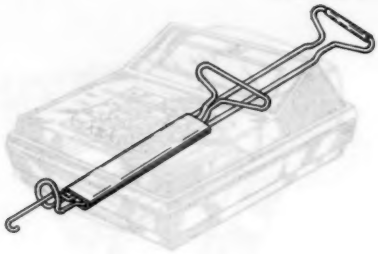
227,757
MOTOR VEHICLE
Carl L. Thoresen, Cedar Rapids, Iowa (150 Oberlin St., Iowa City, Iowa 52240)
Filed July 21, 1971, Ser. No. 164,977
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D14—3 J



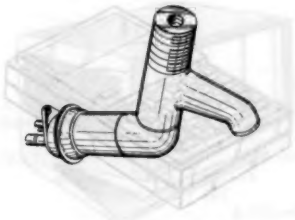
227,758
CASKET SHIPPING COVER
Richard V. Brady, 3608 County Club Drive, Long Beach, Calif. 90807
Filed June 17, 1971, Ser. No. 154,264
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D19—1



227,759
FISH HOOK REMOVER
Anthony Enagureto, 7829 Hamilton Ave., Pittsburgh, Pa. 15208
Filed July 6, 1972, Ser. No. 269,290
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

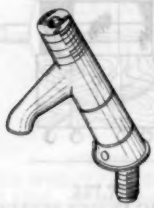


227,760
FAUCET
Dennis Charles Arbon, Bourton-on-the-Water, England, assignor to Walker Crosweller & Company Limited, Cheltenham, Gloucestershire, England
Filed Apr. 12, 1972, Ser. No. 243,548
Claims priority, application Great Britain Oct. 13, 1971
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23

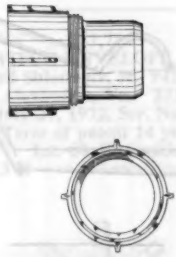


227,761
FAUCET
Dennis Charles Arbon, Bourton-on-the-Water, England, assignor to Walker Crosweller & Company Limited, Cheltenham, Gloucestershire, England
Filed Apr. 12, 1972, Ser. No. 243,549
Claims priority, application Great Britain Oct. 13, 1971
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23

227,762
FAUCET
Dennis Charles Arbon, Bourton-on-the-Water, England, assignor to Walker Crosweller & Company Limited, Cheltenham, Gloucestershire, England
Filed Apr. 12, 1972, Ser. No. 243,550
Claims priority, application Great Britain Oct. 13, 1971
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



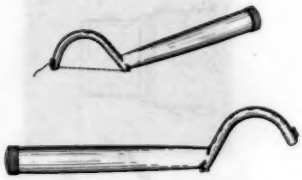
227,763
TRAILER WASTE OUTLET COUPLING WITH OPPOSITELY THREADED FEMALE MEMBER
Claude E. Hand, 1402 3rd St., La Grande, Oreg. 97850
Filed Nov. 11, 1971, Ser. No. 198,036
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43



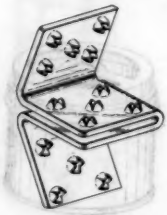
227,764
CAN FOR MOSQUITO REPELLING COILS
Yoshio Katsuda, Osaka, Japan, assignor to Dainippon Jochugiku Kabushiki Kaisha, Osaka City, Osaka-fu, Japan
Filed Mar. 3, 1972, Ser. No. 231,800
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—148

227,765
HOME AIR PURIFIER
Max D. Peters, 633 Turnpike Road, Minneapolis, Minn. 55416
Filed Oct. 13, 1971, Ser. No. 189,077
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—149

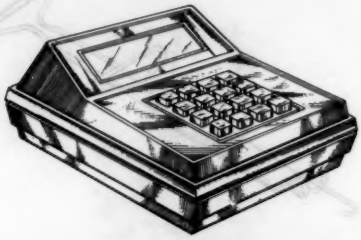
227,766
DENTAL FLOSS DISPENSER AND APPLICATOR
William J. Scherffius, 1829 S. Courtland Ave., Park Ridge, Ill. 60068
Filed Aug. 23, 1972, Ser. No. 283,205
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—1 D



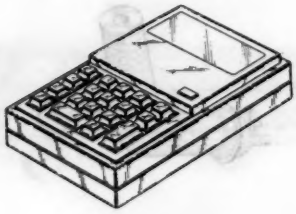
227,767
FOLDABLE ELECTRICAL TERMINAL HAVING LANCES
James Francis Gillespie, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 5, 1971, Ser. No. 112,936
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 E



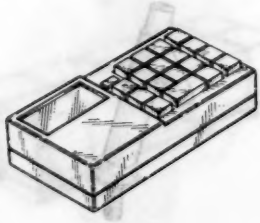
227,768
KEYBOARD TERMINAL OR THE LIKE
Luigi Di Benedetto, El Segundo, Calif., assignor to TRW Data Systems, Inc., Torrance, Calif.
Filed July 13, 1971, Ser. No. 162,322
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



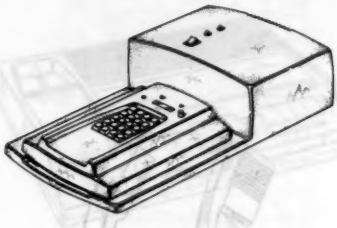
227,769
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co.
Filed May 23, 1972, Ser. No. 256,201
Claims priority, application Japan Nov. 29, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



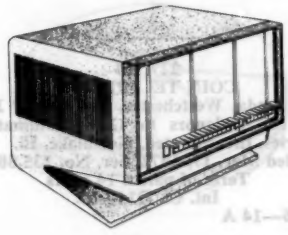
227,770
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto, Japan, assignor to Omron Tateisi Electronics Co.
Filed May 23, 1972, Ser. No. 256,210
Claims priority, application Japan Nov. 29, 1971
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



227,771
COMBINED DATA RECORDER-TRANSMITTER UNIT
Robert P. Mulholland, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Mar. 10, 1972, Ser. No. 233,850
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

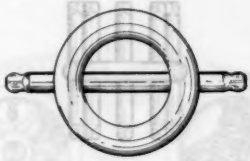


227,772
DIGITAL COMPUTER
John W. Carroll, Pepperell, Paul A. Jenkins, Acton, and Robert St. Amand, West Newton, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Filed Apr. 27, 1972, Ser. No. 248,354
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

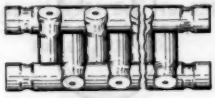


227,773
BATTERY
James R. Dafler, Yardley, and Richard P. Niederberger, Pineville, Pa., assignors to ESB Incorporated
Filed July 13, 1971, Ser. No. 162,323
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D26—6

227,774
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,832
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



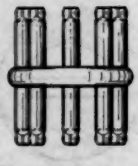
227,775
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,833
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



227,776
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,834
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

227,777
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,835
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

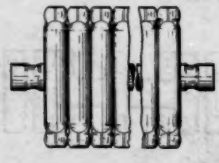
227,778
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,836
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



227,779
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,838
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

227,780
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,837
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R

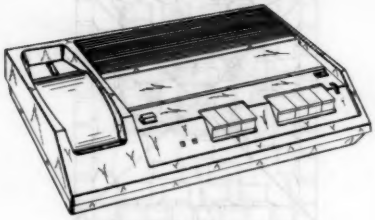
227,781
REED SWITCH ENVELOPE ASSEMBLY
Bernard Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309
Filed July 27, 1972, Ser. No. 275,840
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 R



227,782
TELEPHONE HANDSET
Norman Carroll Hazell, Freehold, N.J., John Niel McGarvey, Drexel Hill, Pa., and Robert Elwyn Prescott, Rumson, and Rembert Ryan Stokes, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 10, 1972, Ser. No. 242,908
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

227,783
COIN TELEPHONE
George M. Janda, Westchester, and Gerald J. Tomany, Berwyn, Ill., assignors to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.
Filed Mar. 17, 1972, Ser. No. 235,887
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

227,784
TELEPHONE ANSWERING UNIT OR SIMILAR ARTICLE
George M. Janda, Westchester, and Gerald J. Tomany, Berwyn, Ill., assignors to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.
Filed Aug. 21, 1972, Ser. No. 282,209
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

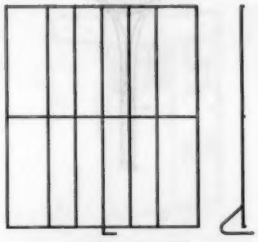


227,785
ENCLOSURE FOR A RADIO OR TELEVISION ANTENNA
Raymond Kaysen, Glenside, Pa., assignor to RCA Corporation
Filed Aug. 11, 1972, Ser. No. 279,864
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 F

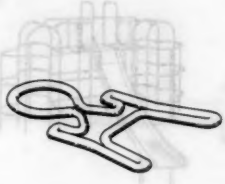
227,786
AUDIO TRANSDUCER HOUSING OR SIMILAR ARTICLE
Terrance N. Taylor, Palatine, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed July 19, 1971, Ser. No. 164,162
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

227,787
SIMULATED COIN
Stanley F. Dann, Oakland, Calif., assignor to World Commerce, Vacaville, Calif.
Continuation-in-part of design application Ser. No. 113,787, Feb. 8, 1971. This application July 12, 1971, Ser. No. 161,392
Term of patent 14 years
Int. Cl. D11—*03*
U.S. Cl. D29—11 F

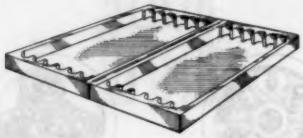
227,788
COMBINED POULTRY CAGE GATE AND LATCH
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Filed Apr. 2, 1971, Ser. No. 130,869
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



227,789
CONNECTOR FOR ROPE, LINE OR SIMILAR ARTICLE
James Earl Weiss, 1494 Howe Road, Kent, Ohio
Filed Apr. 11, 1972, Ser. No. 243,115
Term of patent 14 years
Int. Cl. D30—*80*
U.S. Cl. D30—27



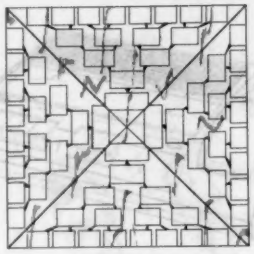
227,790
GAME BOARD
Toma O. Abbo, 2131 NW. 19th, Oklahoma City, Okla. 73107
Filed Jan. 3, 1972, Ser. No. 215,243
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



227,791
GAME RACKET
Minoru Yoneyama, Tokyo, Japan, assignor to Kabushiki Kaisha Yoneyama Racket, Tokyo, Japan
Filed Oct. 6, 1971, Ser. No. 187,225
Claims priority, application Japan July 1, 1971
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

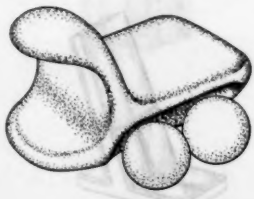
227,792
PLAYGROUND APPARATUS
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.
Filed Jan. 6, 1972, Ser. No. 215,988
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

227,793
GAME BOARD
Eric H. Eck, 8630 Alper Blvd., Westland, Mich. 48184
Filed Apr. 25, 1972, Ser. No. 247,502
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



227,794
GOLF CLUB HEAD
Howard A. Sasse, 27 Clyde Ave., Buffalo, N.Y. 14215
Filed July 13, 1972, Ser. No. 271,216
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

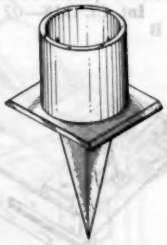
227,795
TOY VEHICLE BODY
Philip F. Seymour, Plymouth, Minn., assignor to Tonka Corporation, Minneapolis, Minn.
Filed Apr. 12, 1972, Ser. No. 243,533
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



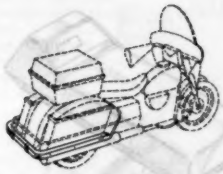
227,796
EXPANSIBLE LINK CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron, Inc., Providence, R.I.
Filed July 3, 1972, Ser. No. 268,590
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E

227,797
PENDANT
Ronald G. Brady, 11832 162nd St., Norwalk, Calif. 90650
Filed Dec. 21, 1970, Ser. No. 26,586
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

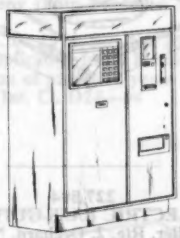
227,798
CANDLE HOLDER
David B. Anderson, Jr., 5526 Douglas Drive, Crystal, Minn. 55429
Filed Feb. 10, 1972, Ser. No. 225,360
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



227,799
MOTORCYCLE LAMP
Sherman E. Taylor, 3307 N. MacArthur, Oklahoma City, Okla. 73122
Filed Jan. 31, 1972, Ser. No. 222,436
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R

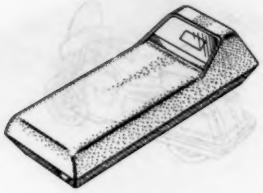


227,800
AUTOMATIC TICKET VENDER
Dave Marshall, Studio City, and Charles R. McGehee, Culver City, Calif., assignors to Western Data Products, Inc., Los Angeles, Calif.
Filed Mar. 15, 1972, Ser. No. 235,106
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3 R

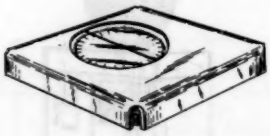


227,801
TEMPERATURE SENSING PROBE
Martin J. Oudewaal, Del Mar, Calif., assignor to Diatek, Inc.
Filed Jan. 19, 1972, Ser. No. 219,204
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7 R

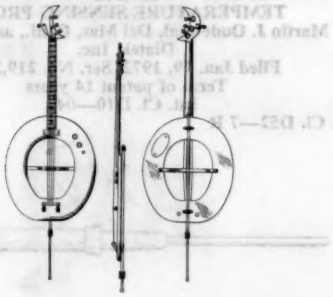
227,802
ELECTRONIC THERMOMETER INSTRUMENT CASE
Ulf Helgesson, Woodland Hills, Calif., assignor to Diatek, Inc.
Filed Mar. 16, 1972, Ser. No. 235,469
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7 R



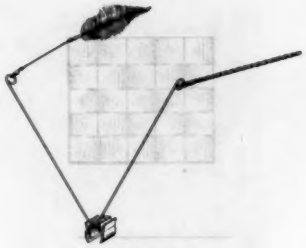
227,803
BATHROOM SCALE
Robert Anthony O'Neil, Glen Ellyn, Ill., assignor to Hanson Scale Company, Northbrook, Ill.
Filed July 10, 1972, Ser. No. 270,024
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—10 R



227,804
ELECTRIC BASS GUITAR
Jerry L. Miller, Rte. 2, Orchard, Nebr. 68764
Filed June 19, 1972, Ser. No. 264,276
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

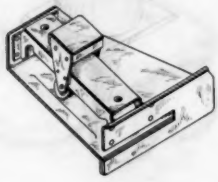


227,805
WIND DIRECTION INDICATOR
Paul A. Odegard, 183 Box Mountain Drive, Vernon, Conn. 06086
Filed July 5, 1972, Ser. No. 269,197
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 D



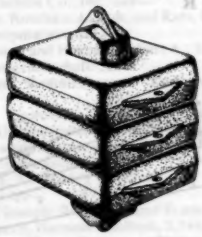
227,806
COMBINED STAND AND SET OF ORIENTAL TEMPLE BLOCKS OR SIMILAR ARTICLE
John W. Wolford, North Madison, Ohio, assignor to The Grossman Music Corporation, Cleveland, Ohio
Filed Mar. 30, 1971, Ser. No. 129,657
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

227,807
PORTABLE IMPRINTER
James M. Patterson, Jr., Fairfax County, Va., assignor to Farrington Business Machines Corporation, Springfield, Va.
Filed May 1, 1972, Ser. No. 249,479
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 B

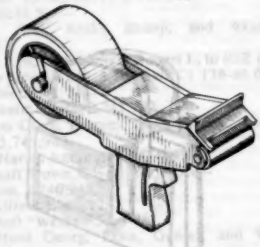


227,808
SCUBA DIVER'S BOARD
William Barkley, 3847 Underwood Drive, 3, San Jose, Calif. 95117
Filed Apr. 15, 1971, Ser. No. 134,545
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1 CC

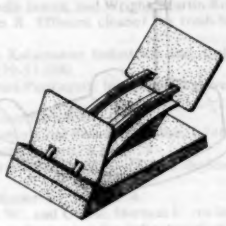
227,809
BOAT FENDER
Evan B. Hull, Northboro, Mass., assignor to Multiform, Inc., Worcester, Mass.
Filed July 12, 1971, Ser. No. 161,404
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1 GG



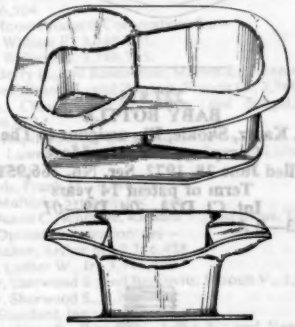
227,810
TAPE APPLICATOR
Elvin L. Boyce, Salt Lake City, Utah, assignor to Tape Licator, Inc., Riverton, Utah
Filed July 19, 1971, Ser. No. 164,209
Term of patent 3½ years
Int. Cl. D19—*02*
U.S. Cl. D74—1 B



227,811
CARD FILE
Donald Lee McFarland, Santa Barbara, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Aug. 23, 1971, Ser. No. 174,298
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2 A



227,812
BED-PAN CARRIER
Kenneth Wilson Mills, Bolton, England, assignor to Vernon & Company (Pulp Products) Limited, Lancashire, England
Filed Nov. 24, 1971, Ser. No. 202,069
Claims priority, application Great Britain July 8, 1971
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 U

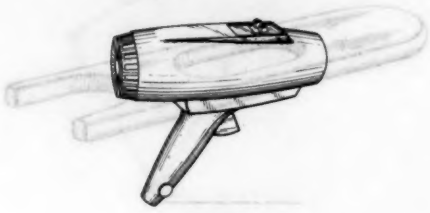


227,813
SELF-PROPELLED CART FOR INVALIDS
Antony Charles Robert Armstrong Jones, Kensington Palace, London, England
Filed May 4, 1972, Ser. No. 250,484
Claims priority, application Great Britain Nov. 10, 1971
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D83—1 E

227,814
SELF-PROPELLED CART FOR INVALIDS
Antony Charles Robert Armstrong Jones, Kensington Palace, London, England
Filed June 5, 1972, Ser. No. 260,069
Claims priority, application Great Britain Dec. 28, 1971
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D83—1 E

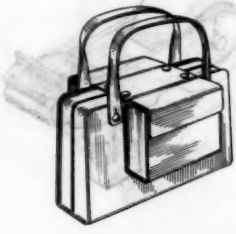
227,815
BABY BOTTLE
Phillip V. Kantz, Skokie, Ill., assignor to The Kendall Company, Walpole, Mass.
Filed June 28, 1972, Ser. No. 266,951
Term of patent 14 years
Int. Cl. D24—*04;* D9—*01*
U.S. Cl. D83—8 A

227,816
ELECTRIC HAIR DRYER
Alfred W. Madl, Glendale, and Charles J. Kirschling, Milwaukee, Wis., assignors to Oster Corporation, Milwaukee, Wis.
Filed Jan. 28, 1972, Ser. No. 221,856
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



227,817
UMBRELLA CASE
Peter Kortenbach, Solingen-Weyer, Germany, assignor to Kortenbach & Rauh, Kommanditgesellschaft, Solingen-Weyer, Germany
Filed Mar. 20, 1972, Ser. No. 236,557
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R

227,818
BRIEFCASE WITH DETACHABLE PURSE
Barbara Jean Dipadova, 509 E. Buckthorn, Inglewood, Calif. 90301
Filed Nov. 3, 1971, Ser. No. 195,530
Term of patent 7 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 B



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TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF JULY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aanstad, Ola J., to Westinghouse Electric Corporation. Control apparatus for operating a control valve servo-motor. 3,745,884, Cl. 91-374.000.

Aaron, Maurice E.; and Armstrong, Leonard, said Aaron assor. to Resources Control Corporation. Carousel indexing system for solid waste compactor. 3,745,856, Cl. 74-819.000.

AB Vibro-Verken: *See—*
Fransson, Johnny; Holmlund, Henrik; and Kareby, Erik, 3,746,310.

Abbott Laboratories: *See—*
Endicott, Clarence J.; Brown, Paul W.; and Andrews, Leonard S., 3,746,554.

Abe, Takeo: *See—*
Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, 3,746,525.

Abens, Sandors G.: *See—*
Walk, Charles R.; and Abens, Sandors G., 3,746,940.

Aber, Leon J., to Philco-Ford Corporation. Color cathode ray tube deflection yoke evaluation. 3,746,910, Cl. 315-13.00c.

Abex Corporation: *See—*
Jones, Roger D.; and Burnham, Peter B., 3,746,403.

Acton, Daniel D.: *See—*
Hart, Alexander W.; and Acton, Daniel D., 3,746,199.

Adachi, Kazuo; Tai, Akira; Higashi, Fukuji; and Shibata, Katsuya, to Tekkosha Co., Ltd. Poly-(imino(2,5-dialkoxycarbonyl-1,4-phenylene) iminoarylene). 3,746,684, Cl. 260-47.0cp.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Mandoline effect producing circuit for electronic musical instrument. 3,746,774, Cl. 84-1.220.

Adahan, Carcli. Brake control device. 3,746,404, Cl. 303-21.00f.

Adelman, Robert Leonard, to Du Pont de Nemours, E. I., and Company. Conductive systems. 3,746,662, Cl. 252-513.000.

Advance Sewing Machine Co., Inc.: *See—*
Desperak, Sam; Roschko, Joseph; and Katz, Max, 3,745,948.

Aerojet-General Corporation: *See—*
Brunetz, Nickolas; and Haskell, Robert A., 3,746,588.

Afga-Gevaert Aktiengesellschaft: *See—*
Mischo, Klaus; Rammesberger, Karl; and Fischer, Erwin, 3,746,234.

Ageev, Vladimir Egorovich; Bukatova, Vera Evgenievna; and Dmitriev, Oleg Alexandrovich. Device for controlling the speed of a D.C. motor with a noncontact switch. 3,746,941, Cl. 318-138.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Heilmann, Max, 3,746,544.

Agfa-Gevaert N.V.: *See—*
Pollet, Robert Joseph; Willems, Jozef Frans; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,746,545.

Ahmed, Mushtaq; and Glazer, Sydney, to National Cash Register Company, The. Carrier detection circuit. 3,746,993, Cl. 325-320.000.

Air Advantage (Australia) Pty., Limited: *See—*
McIntosh, Ian Arthur; Bowers, Norman Josh; and Bowers, Brian Alfred, 3,746,104.

Air Products and Chemicals, Inc.: *See—*
Beale, John H.; and Carroll, Felix P., 3,746,663.

Airco, Inc.: *See—*
Hughey, Howard G., 3,746,500.
Terrell, Ross C., 3,746,769.
Terrell, Ross C., 3,746,770.

Aisin Seiki Kabushiki Kaisha: *See—*
Ishikawa, Kazuo, 3,746,135.
Yamazaki, Shinichiro, 3,746,307.

Aitken, Ian Donald; Rhodes, Gordon; and Spencer, Raymond Anthony Philip, to National Research Development Corporation. Carbon fibre treatment. 3,746,506, Cl. 8-108.000.

Akazawa, Hakuichi: *See—*
Shimazaki, Eiki; Araki, Shunji; and Akazawa, Hakuichi, 3,746,557.

Aker, Wesley E.; and McCormick, Robert J., to ESB Incorporated. Gas depolarizable galvanic cell. 3,746,580, Cl. 136-86.00a.

Aktiebolaget Electrolux: *See—*
Kogel, Wilhelm Georg, 3,745,783.
Ljung, Hans Glorg; Barrner, Dan Johannes; and Grellsson, Karl Gustav, 3,745,965.
Wallgren, Harald Anton Ake, 3,746,032.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Marek, Alois, 3,746,948.
Wunsch, Alfred, 3,746,128.

Aktiengesellschaft "Weser": *See—*
Janssen, Hans Georg; Ecke, Gunter; and Wiese, Friedmar, 3,746,060.

Akzona Incorporated: *See—*
Koster, Olav E., 3,746,486.

Alcivar, Ernesto A., to Johnson, Dennis J. and McCarthy, Brian N. Tissue conduction microphone utilized to activate a voice operated switch. 3,746,789, Cl. 179-1.0vc.

Alderman, Roy. Denture adherence device. 3,745,652, Cl. 32-3.000.

Alfa-Laval AB: *See—*
Ehnstrom, Lars Karl Johan, 3,746,550.

Alford & Alder (Engineers) Limited: *See—*
Bunker, Kenneth James; and Wright, Martin Ronald, 3,746,045.

Allbritton, William R. Effluent cleaner for trash-burning. 3,745,939, Cl. 110-8.00a.

Allen, Plateau, to Kalamazoo Industries, Inc. Collet chuck adapter. 3,746,353, Cl. 279-51.000.

Allen, R. H., to Estex Packaging, Inc. Surgical glove carton. 3,746,152, Cl. 206-7.00f.

Allied Chemical Corporation: *See—*
Fuhrmann, Robert; and Pisanchyn, John, 3,746,763.
Johnson, Edward Robert, 3,746,528.
Oxenrider, Bryce C.; Woolf, Cyril; and Beyleveld, Wilhelmus M., 3,746,952.
Stephenson, Robert L., 3,746,214.

Allington, Robert W.; and Griess, Herbert C., to Instrumentation Specialties Company. Apparatus for indicating that a chromatographic signal has ended. 3,746,982, Cl. 324-77.00a.

Allis-Chalmers Corporation: *See—*
Hartwig, Walter J., 3,745,670.
McGill, Jack W., 3,747,038.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Torok, Vilmos; and Skoog, Hans O., 3,746,966.

Allocca, Nick D. Paving blocks. 3,746,458, Cl. 404-37.000.

Alps Electric Co., Ltd.: *See—*
Sawada, Akihisa; and Fujimori, Katsuzo, 3,745,837.

Alred, Ray. Spherical vehicle. 3,746,117, Cl. 180-21.000.

Altorfer, Edward J. Three-wheeled vehicle with passenger banking. 3,746,118, Cl. 180-25.00r.

Altseimer, Lukas G. Templet for electrical boxes. 3,745,664, Cl. 33-174.00g.

Aluminum Company of America: *See—*
Livelsberger, Bert V., 3,745,803.

Amdur, Elias J.: *See—*
Werner, Joseph J.; and Amdur, Elias J., 3,746,046.

American Cyanamid Company: *See—*
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,746,505.
Behrens, Rudolf Adolf, 3,746,674.
Booth, Robert Ben, 3,746,641.
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,746,708.

American Gas Association, Inc., mesne: *See—*
Solbrig, Charles W.; Weil, Sanford A.; and Rosenberg, Robert B., 3,746,504.

American Home Products Corporation: *See—*
Bruce, William F., 3,746,703.
Bruce, William F., 3,746,715.
Malis, Jerry L.; and Rosenthale, Marvin E., 3,746,495.
Stepanek, Frank E.; and Winters, Francis G., 3,746,295.
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,746,623.

American Hospital Supply Corporation: *See—*
Blake, Lawrence W.; Bett, Bruce D.; and Lieber, Clement E., 3,746,003.
Edwards, Frank M., 3,746,000.

American Multiples Systems, Inc.: *See—*
Fox, Duane C.; Ichinose, Richard Y.; and Klaus, Tal E., 3,747,067.

American Optical Corporation: *See—*
Shoemaker, Arthur M., 3,746,428.
Smith, Luther W., Jr., 3,746,450.
Thaler, Sherwood S.; and Berkovits, Barouh V., 3,746,005.
Thaler, Sherwood S., 3,746,006.

American Standard, Inc.: *See—*
Zey, Aubrey F.; Przygocki, Julius V.; and Van Huffel, Phillip, 3,745,751.

American Technical Industries, Inc.: *See—*
Circelli, Peter A., 3,746,600.

American Velcro, Inc.: *See—*
Perina, Joseph, 3,745,709.

Ametek, Inc.: *See—*
Cosson, Harold E., 3,746,034.
Keenan, Charles E.; and Power, William A., 3,745,821.

AMF Incorporated: *See—*
Morley, Edwin R., 3,746,900.

Amoco Production Company: *See—*

Blenkarn, Kenneth A., 3,745,777.

AMP Incorporated: *See—*
Johnson, Erlon Fitch; and Kopenhaver, Kenneth Oscar, 3,747,048.
Swengel, Robert Charles, Sr.; and Crumley, J. A., 3,747,051.

Amsted Industries, Incorporated: *See—*
Schmuck, James E.; and Troy, Walter C., 3,746,073.

Analog Devices Inc.: *See—*
Pastoriza, James J., 3,747,088.

Anatalio, Perfecto T., to General Electric Company. Vessell stabilization system. 3,746,292, Cl. 248-154.000.

Anchor Hocking Corporation: *See—*
Hart, Alexander W.; and Acton, Daniel D., 3,746,199.
Ochs, Charles S.; and Probascs, Charles W., 3,746,163.
Oglesbee, Richard K., 3,746,245.

Andco Incorporated: *See—*
Sawyer, Alan B., 3,746,322.

Anderheggen, Manfred; and Buhren, Heinz, to Schlafhorst, W., & Co. Device for isolating textile coils. 3,746,212, Cl. 221-253.000.

Andersen, Kare: *See—*
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, 3,746,491.

Anderson Electric Corporation: *See—*
Peek, Vernon E., 3,746,777.

Anderson, Gene W.: *See—*
Gray, John; and Anderson, Gene W., 3,746,471.

Anderson, James E., to Kraft, John, Sesame Corporation. Process for cleaning spices and herbs. 3,746,553, Cl. 99-140.00r.

Anderson, Robert L., to Bertea Corporation. Digital control valve and control system. 3,745,882, Cl. 91-1.000.

Ando, Sadanao; and Miyagawa, Umihiro, to Kabushiki Kaisha Ricoh. Electrostatic image developing device. 3,745,898, Cl. 95-13.000.

Andres, Rudolf; Kolle, Erwin; and Binder, Rudolf, to Dainler-Benz Aktiengesellschaft. Safety belt installation. 3,746,393, Cl. 297-385.000.

Andrews, Leonard S.: *See—*
Endicott, Clarence J.; Brown, Paul W.; and Andrews, Leonard S., 3,746,554.

Andrews, Theodore E.; and Weller, John J., to Armstrong Cork Company, mesne. Slitting and routing machine. 3,745,621, Cl. 29-33.00d.

Andrews, Theodore E., to Armstrong Cork Company. Conveyor-mold construction. 3,746,487, Cl. 425-184.000.

Andrysiak, Carl D.; and Wilson, Richmond W., to Corning Glass Works. Method and apparatus for forming multi-bore tubing. 3,746,085, Cl. 165-172.000.

Anheuser-Bush, Incorporated: *See—*
Kovats, Leslie P., 3,746,699.

Aoki, Masaharu; Kasano, Hiroyuki; Kurata, Kazuhiro; and Ogirima, Masahiko, to Hitachi, Ltd. Semiconductor electronic device. 3,746,943, Cl. 317-234.00r.

Apparecchi Electronici Marposs: *See—*
Possati, Mario, 3,745,968.

Appelt, Weldon F. Aerial pipeline system. 3,745,601, Cl. 14-77.000.

Appleby, Paul E.; Woodhall, Edwin S.; and Christie, Christopher E., to Goodyear Tire & Rubber Company, The. Tire building machine and method. 3,746,597, Cl. 156-396.000.

Applied Power Industries, Inc.: *See—*
Bradley, Arthur S., 3,746,476.

Apri, Edward W. Shielded reaction sprinkler. 3,746,259, Cl. 239-229.000.

Arai, Haruhiko; Horin, Shoji; and Maruta, Iwao; deceased (by Maruta, Koyoko; and Maruta, Yoshi; heirs), to Kao Soap Co., Ltd. Adhesive composition having high initial adhesive strength. 3,746,677, Cl. 260-27.00r.

Araki, Shunji: *See—*
Shimazaki, Eiki; Araki, Shunji; and Akazawa, Hakuichi, 3,746,557.

Arams, Frank R.: *See—*
Pace, Frank P.; Lange, Ronald A.; and Arams, Frank R., 3,746,454.

Arata, Masahiro: *See—*
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Arbour, Jules E., III: *See—*
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Architectural Art Mfg., Inc.: *See—*
Thom, Wenzel W., 3,745,726.

Arenson, Edwin M.; deceased (by Arenson, Gloria W.; executrix), to Black, Sivalls & Bryson, Inc. Method of vaporizing a liquid stream. 3,746,079, Cl. 165-1.000.

Arenson, Gloria W.: *See—*
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A.R.F. Products, Incorporated: *See—*
Ringer, Kenneth W., 3,747,108.

Arff, John H. Air purifier. 3,745,750, Cl. 55-102.000.

Arkhipov, Robert Georgievich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.

Armand, Marc, to Babcoak-Atlantique. Apparatus for drying and superheating steam. 3,745,978, Cl. 122-483.000.

Armand, Rene: *See—*
Jampy, Pierre; Bouix, Henri; and Armand, Rene, 3,745,878.

Armbruster, Otto: *See—*
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Armstrong Cork Company: *See—*
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Davey, John R.; Gilbo, Charles F.; Johnson, Norman A.; and Fritz, Thomas W., 3,745,734.
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Armstrong Cork Company, mesne: *See—*
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Armstrong, David Alun, to British Steel Corporation. Thickness gauge. 3,745,833, Cl. 73-67.80r.

Armstrong, Leonard: *See—*
Aaron, Maurice E.; and Armstrong, Leonard, 3,745,856.

Armstrong, William A.: *See—*
Titchenal, Oliver R.; and Armstrong, William A., 3,746,056.

Arnaudin, Edwin H., Jr.; Christiansen, Wilbert H.; and Hazelett, Robert M., Jr. Method of detecting holidays during dual extrusions. 3,746,575, Cl. 117-218.000.

Arnold, Sieghard, to International Business Machines Corporation. Tractor feeding device for marginally perforated webs. 3,746,228, Cl. 226-75.000.

Arthur, Robert M. Method and apparatus for determining the amount of settleable and suspended solids in a liquid. 3,746,167, Cl. 210-70.000.

Arvanetakis, Kiryako, to Monroe X-Ray Company, Inc. Wireless control of machines inside a pipeline. 3,747,054, Cl. 340-15.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Miyakawa, Seinan; Noda, Nobuhiro; and Shimoda, Mitsuhiko, 3,745,901.

Asano, Hiroaki; and Kobayashi, Hiroshi, to Toyoda Koki Kabushiki Kaisha. Measuring apparatus. 3,745,660, Cl. 33-143.00r.

Ashaway Line & Twine Mfg. Co.: *See—*
Crandall, Julian T., 3,745,756.

Ashe, John B.; and Hall, James D., to Nuclear-Chicago Corporation. Tomography technique in which a single recording film retains spatial information to permit constructing all planar sections of object. 3,746,872, Cl. 250-61.500.

Ashikian, Baroir. Annular springs. 3,746,331, Cl. 267-182.000.

Asikainen, Niilo Kalervo; and Koskinen, Esko Ilmari, to Oy Tampella AB. Grenade launcher bipod support. 3,745,879, Cl. 89-37.00c.

Associated Electrical Industries, Limited: *See—*
Hilditch, David Henry, 3,746,855.

Astor, Edward: *See—*
LoCascio, Jack J.; and Astor, Edward, 3,746,008.

Atkinson, Joseph G.; and Luke, Michael O., to Frosst, Charles E., & Co. Deuterated lubricating oils. 3,746,634, Cl. 208-18.000.

Atlantic Richfield Company: *See—*
Dieter, Jerry A.; Wolgemuth, Larry G.; and Ryan, Thomas J., 3,746,667.
Kilmer, Lauren G., 3,746,120.
Reid, John C., Jr., 3,746,744.

Attridge, Russell G., Jr., to Ranco Incorporated. Method and system for controlling air temperature in an air conditioned zone. 3,745,778, Cl. 62-89.000.

Atwell, William H.; and Bokerman, Gary N. Synthesis of silylmetallic complexes. 3,746,732, Cl. 260-429.00r.

Atzberger, Frank. Brake gauge for measuring brake drums and brake disc rotors. 3,745,661, Cl. 33-147.00j.

Auer, Norbert: *See—*
Scherb, Gustav; and Auer, Norbert, 3,745,867.

Augl, Joseph M.: *See—*
Duffy, James V.; and Augl, Joseph M., 3,746,687.

Aulisa, Gerard D., to Sun Oil Company of Pennsylvania. Sealing device for nipples. 3,746,370, Cl. 285-15.000.

Ault, C. M. Automatic telephone interface device. 3,746,790, Cl. 179-1.0hf.

Auric Corporation: *See—*
Kosowsky, Leo N.; Lovejoy, Curtis N.; and Cunniff, John G., 3,746,630.

Ausnit, Anne Marie Eva; and Ausnit, Steven. Reclosable sealed pouring bag. 3,746,215, Cl. 222-92.000.

Ausnit, Steven: *See—*
Ausnit, Anne Marie Eva; and Ausnit, Steven, 3,746,215.

Austin, Garland R., to Lowrance Electronics Mfg., Corporation. Noise rejection circuit. 3,747,053, Cl. 340-3.00r.

Austin, John J., Jr.; and Desmond, John D., to Container Corporation of America. Display package for collapsible tube or the like. 3,746,156, Cl. 206-45.140.

Austin, Thomas Charles; and Bryant, Herbert William, to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer having improved transducing element supporting means. 3,746,898, Cl. 310-9.400.

Australian Paper Manufacturers Limited: *See—*
Majewski, Zbigniew Jan, 3,746,593.

Automation Industries, Inc.: *See—*
Walker, Gerald E., 3,746,890.

Automotive Products Company Limited: *See—*
Parsons, David; and Bailey, Walter William, 3,746,810.

Avance Oil & Gas Co., Inc.: *See—*
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Avco Corporation: *See—*
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Avenarius, Ernst Frederik: *See—*

Van Best, Jasper Anton; Avenarius, Ernst Frederik; and De Zeeuw, Jan Willem, 3,746,930.
Avey, William R., Jr.: *See—*
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Avtron Manufacturing, Inc.: *See—*
Hetzel, Robert J., 3,746,902.
Ayres, David B. Fluid connection apparatus incorporating control valve. 3,746,043, Cl. 137-614.040.
Azinger, Frederick A., Jr.: *See—*
Fey, Maurice G.; Wolf, Charles B.; Azinger, Frederick A., Jr.; and Kemeny, George A., 3,746,830.
Azum, Jacques; and Claustre, Roger, to Societe Nationale Industrielle Aerospatiale. Apparatus for determining the centre of gravity of passengers in a vehicle, namely an aircraft. 3,746,844, Cl. 235-150.200.
Babcoak-Atlantique: *See—*
Armand, Marc, 3,745,978.
Bachelder, Albert J.; and Binda, Frederick J., to Polaroid Corporation. Method of manufacturing photographic film unit. 3,746,594, Cl. 156-216.000.
Bacon, Charles H., Company, mesne: *See—*
Brackett, Bobby H.; and Jaynes, Charles A., 3,745,794.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Reicheneder, Franz; Dury, Karl; Krusche, Georg; and Burger, Heinz, 3,746,726.
Stange, Karl; Jenne, Helmut; Weiss, Hans-Peter; and Koenig, Ulrich, 3,746,609.
Bafford, Richard Anthony; Kamens, Ernest Rudolph; and Mageli, Orville Leonard. Addition reaction involving diperoxyfumarate and compounds having diperoxysuccinyl groups. 3,746,735, Cl. 260-453.00r.
Bagloi, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Iarailevich; Latash, Jury Vadimovich; and Bagloi, Vitaly Mikhailovich, 3,746,075.
Bailey, Christopher Edmund Gervase, to Solartron Electronic Group Limited, The. Cordic digital calculating apparatus. 3,746,849, Cl. 235-156.000.
Bailey, David L.; Fiorino, Benjamin C.; and Rodriguez, Juan A., to International Business Machines Corporation. Reducing dead-tracking in recording systems. 3,747,079, Cl. 340-174.10b.
Bailey, Walter William: *See—*
Parsons, David; and Bailey, Walter William, 3,746,810.
Bainbridge, John Graham: *See—*
Mehta, Minoo Dossabhoy; and Bainbridge, John Graham, 3,746,743.
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Manufacture and operation of gas discharge panel. 3,746,420, Cl. 316-20.000.
Bakul, Valentin Kikolaevich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.
Bala, John L.; and Ford, Peter W., to Itek Corporation. Tool monitoring apparatus. 3,747,085, Cl. 340-267.00r.
Baldwin, D. H., Company: *See—*
Brean, John W.; and Mathevosian, Ervand, 3,746,430.
Uetrecht, Dale M., 3,746,773.
Balfane, Frederick J.: *See—*
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Ball Corporation: *See—*
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Van Oosterhout, Jack T., 3,746,784.
Balz, Gunther W., to Roto-Finish Company. Finishing method. 3,745,722, Cl. 51-314.000.
Banba, Toshitsugu: *See—*
Takeda, Mutsuo; Nakajima, Takeji; Takahata, Kenji; and Banba, Toshitsugu, 3,746,584.
Banfield, David Leslie, to United Kingdom Atomic Energy Authority. Method of making a semi-permable membrane tube. 3,746,591, Cl. 156-191.000.
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., to American Cyanamid Company. Treatment of cellulosic textiles with 1, 3-dimethylol-4,5-dihydroxy-2-imidazoidinone, zinc nitrate and a sequestering agent. 3,746,505, Cl. 8-74.000.
Bao, Vemulapalli Durganigeswar; and Telang, Yeshwant Pandharinath. Rubbing seal for high temperature ceramics. 3,746,352, Cl. 277-235.
Barber, Lloyd L., Jr., to Standard Precision, Inc. Adjustable stops for drawer slides. 3,746,418, Cl. 312-348.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Bauer, Karl; Mayer, Manfred; Illg, Peter; and Schimmel, Bernd, 3,746,233.
Schippers, Heinz, 3,746,318.
Schippers, Heinz, 3,746,481.
Barnes Engineering Company: *See—*
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Barr-Stalfort Company; division of Pittway Corporation: *See—*
Knnningham, Ernest R.; and Dodson, Marshall, 3,745,741.
Barrett, John H., Jr. Stable liquid enzyme product. 3,746,649, Cl. 252-170.000.
Barrner, Dan Johannes: *See—*
Ljung, Hans Glorg; Barrner, Dan Johannes; and Grellsson, Karl Gustav, 3,745,965.
Bartels, Philip R.: *See—*
Schwarz, Eckhard C. A.; and Bartels, Philip R., 3,746,574.
Bartley, Donald R.; and Sidles, James, to Goodrich, B. F., Company, The. Method of making a pneumatic tire having a belt wound from a tape. 3,746,590, Cl. 89-117.000.
Bartusek, Robert Joseph; and Eckert, Elmer Richard, to Deere & Company. Drive transmission means. 3,746,143, Cl. 198-88.000.
BASF Wyandotte Corporation: *See—*
Narayan, T. V. Lakshmi; and Cenker, Moses, 3,746,689.
Patton, John T., Jr.; Cenker, Moses; and Kan, Peter T., 3,746,709.
Batchelder, Charles F.: *See—*
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Batchelder Rubico, Inc.: *See—*
Rubico, Jerome A.; and Batchelder, Charles F., 3,745,600.
Bates, Charles E.: *See—*
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Bateson, Robert N.; and Harper, Judson M., to General Mills, Inc. Apparatus and process for puffing food products. 3,746,546, Cl. 99-81.000.
Batterson, Norman D.: *See—*
Reeder, Wilbur C.; and Batterson, Norman D., 3,746,263.
Batts, John H., to Batts, John Thomas, Inc. Clamp with improved latch. 3,745,616, Cl. 24-255.0sl.
Batts, John H., to Batts, John Thomas, Inc. Molded garment hanger with clamping trouser bar. 3,746,223, Cl. 223-91.000.
Batts, John Thomas, Inc.: *See—*
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Batts, John H., 3,746,223.
Batyrev, Alexei Vasilievich: *See—*
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Baude, Andre Rene: *See—*
Iteboul, James Remy Albert; Baude, Andre Rene; and Schieving, Jean, 3,746,452.
Bauer, Karl; Mayer, Manfred; Illg, Peter; and Schimmel, Bernd, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Air-supported thread overrun roller. 3,746,233, Cl. 226-194.000.
Baughman, Herbert: *See—*
Yetter, Harry G.; and Baughman, Herbert, 3,745,944.
Baumann, Hans G., to Demag Aktiengesellschaft. Device for the continuous casting and subsequent rolling of a metal from its casting heat in short steps. 3,746,076, Cl. 164-270.000.
Baumann, Hans-Georg, to Demag Aktiengesellschaft. Apparatus for regulating the solidification of the liquid core in a continuous casting. 3,746,074, Cl. 164-250.000.
Baxter Laboratories, Inc.: *See—*
Ralston, Philip G., Jr., 3,746,001.
Bayer Aktiengesellschaft: *See—*
Hammann, Ingeborg; Hoffmann, Peter; Kleimann, Helmut; Marouarding, Dieter; Offermann, Klaus; Ugi, Ivar; and Unterstenhofer, Gunter, 3,746,766.
Sasse, Klaus, 3,746,719.
Bayle, Robert Vincent, to Gemmer-France. Rack and pinion steering gear. 3,745,850, Cl. 74-422.000.
Bayless, Frank K.; Brundage, Horace W.; Evans, Robert A.; and Hoover, John W. Vacuum cleaner suction tool for cleaning deep pile shag rugs. 3,745,603, Cl. 15-397.000.
Beale, John H.; and Carroll, Felix P., to Air Products and Chemicals, Inc. Process for preparation of a polyurethane foam using a polymeric liquid foam stabilizer. 3,746,663, Cl. 260-2.5ag.
Bear Brand Hosiery Co.: *See—*
Heinig, Richard H.; and Bowen, Omer, 3,745,793.
Beaudin, Mary Louise. Candle canopy. 3,746,852, Cl. 240-10.00r.
Becavin, Henri G., to Thomson-CSF. High performance radio-navigation stationcus. 3,747,101, Cl. 343-106.00r.
Bechtiger, Charles G., to Relhor S.A. Delayed snap action microswitch. 3,746,808, Cl. 200-67.00h.
Beebe, William F.: *See—*
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Beecham Group Limited: *See—*
Mehta, Minoo Dossabhoy; and Bainbridge, John Graham, 3,746,743.
Beeli, Johann Battesta; Brown, Roger Henry; and Reif, Philip George, to International Telephone and Telegraph Corporation. Photo-multiplier structure. 3,746,903, Cl. 313-67.000.
Behrens, Rudolf Adolf, to American Cyanamid Company. Vulcanization of halogen-containing acrylic elastomers. 3,746,674, Cl. 260-23.0ar.
Beilke, James E.; and Schulke, Edward W., said Schulke, Edward W., assor. to Clifford Z. Peters. Lowering bed trailer. 3,746,195, Cl. 214-506.000.
Beistle, Rex G., to International Business Machines Corporation. Web cleaning apparatus having a movable blade. 3,745,602, Cl. 15-308.000.
Belaef, Nikolai: *See—*
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Bell & Howell Company: *See—*
Murre, Robert W.; and Schulz, Herman C., 3,745,863.
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Bell Canada-Northern Electric Research Limited: *See—*
Kosman, Karel Jan Williams; Boivin, Louis-Philipp; and Fefer, Dennis, 3,746,853.

Bell, Oliver A., Jr., to Colt Industries Operating Corporation. Short circuit protection system for electrical discharge machining power supply apparatus. 3,746,826, Cl. 219-69.00s.

Bell Telephone Laboratories, Incorporated: *See—*
Austin, Thomas Charles; and Bryant, Herbert William, 3,746,898.
Clary, James Barney, 3,746,848.
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Huttenhoff, John Harry, 3,747,070.
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Peoples, John Terrance, 3,746,996.
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Bellisio, Arthur Angelo: *See—*
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Psyras, Hippocrates G.; and Bellisio, Arthur Angelo, 3,745,747.

Bell's Asbestos and Engineering Pty., Limited: *See—*
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Bendix Corporation: *See—*
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Bendix Corporation, The: *See—*
Henegar, Hubert B.; and Patterson, Robert J., 3,746,845.
Hickner, George B.; and Hendrickson, Richard T., 3,746,402.
Payne, Delmar V., 3,747,105.

Benjamin, John Stanwood: *See—*
Cairns, Robert Lacock; and Benjamin, John Stanwood, 3,746,581.

Bennett, Hilliard D. Multi-functional table arrangement. 3,745,936, Cl. 108-48.000.

Bennett, Robert A. Handy mans wrench. 3,745,860, Cl. 81-121.00r.

Bennett, Ronald E., to Westinghouse Electric Corporation. Circuit breaker with improved trip means. 3,747,033, Cl. 335-35.000.

Bennon, Saul: *See—*
Wagenaar, Loren B.; True, Walter F.; and Bennon, Saul, 3,746,935.

Benoit, Edith C., 20% to Lee, Raymond, Organization, Inc., The. Drawer eivider. 3,746,181, Cl. 211-184.000.

Bensinger, Wolf-Dieter, to Daimler-Benz Aktiengesellschaft. Method of preassembly and assembly of a multipartite seal. 3,745,630, Cl. 29-156.600.

Benz, Konrad: *See—*
Olesen, Finn; and Benz, Konrad, 3,747,096.

Berger, Abe; and Selin, Terry G., to General Electric Company. Acrylate or methacrylate silanes. 3,746,734, Cl. 260-448.20b.

Bergmann, Gerhard, to Mayer, Karl, Textilmaschinenfabrik G.m.b.H. Warp knitting machine mechanism. 3,745,792, Cl. 66-86.000.

Bergmeyer, Hans Ulrich; Bernt, Erich; and Rey, Hans-Georg. Stabilized coenzyme test compositions. 3,746,625, Cl. 195-103.50r.

Bergstein, Frank D., to Bergstein Packaging Trust, The. Sift-proof carton construction. 3,746,244, Cl. 229-37.00r.

Bergstein Packaging Trust, The: *See—*
Bergstein, Frank D., 3,746,244.

Bergstrom, Theodore R., to Minnesota Mining and Manufacturing Company. Sintered powdered metal filter. 3,746,642, Cl. 210-446.000.

Berivon Company, The: *See—*
Rush, Leslie V., Sr., 3,745,996.

Berkau, Eugene E., to Monsanto Company. Continuous drying and crystallization process for polyesters. 3,746,688, Cl. 260-75.00t.

Berkhout, Frans; and Wilhelmus, Hermanus Johannes, to Scholten-Honig Research N.V. Suspensions of hydrophobic starch esters. 3,746,558, Cl. 106-213.000.

Berkovits, Barouh V.: *See—*
Thaler, Sherwood S.; and Berkovits, Barouh V., 3,746,005.

Bernard, Arthur A.; and Bernard, Richard A., to Dover Corporation. Arc welding gun unitized gas hose and electrical control cord. 3,746,832, Cl. 219-130.000.

Bernard, Richard A.: *See—*
Bernard, Arthur A.; and Bernard, Richard A., 3,746,832.

Bernardi Bros., Inc.: *See—*
Bernardi, Donald A.; and Chambers, Samuel S., 3,746,251.

Bernardi, Donald A.; and Chambers, Samuel S., to Bernardi Bros., Inc. Load shifting apparatus. 3,746,251, Cl. 238-4.000.

Berndt, Joachim: *See—*
Kuhdorf, Gunther; and Berndt, Joachim, 3,746,632.

Bernic, Thornber B.: *See—*
Woodward, Frederick W., 3,746,386.

Bernt, Erich: *See—*
Bergmeyer, Hans Ulrich; Bernt, Erich; and Rey, Hans-Georg, 3,746,625.

Berrer, Dagman; and Vogel, Christian, to Ciba-Geigy Corporation. Herbicidal 4-methoxy-2,6-diamino-s-triazines. 3,746,530, Cl. 71-93.000.

Bertea Corporation: *See—*
Anderson, Robert L., 3,745,882.

Bertelloti, Ansano, to GTE Automatic Electric Laboratories Incorporated. Guard for preventing inadvertent operation of electrical switches. 3,746,818, Cl. 200-168.00h.

Bertheas, Jean, to Thomson-CSF. Self-guidance methods and devices for anti-submarine missiles. 3,745,956, Cl. 114-23.000.

Berthiaume, Pierre P.; Bowler, William; Cass, George Robert; Schotman, Jan; Scott, J. Frank; and Thivierge, Jacques, to Canadian National Railway Company. Short scale for weighing railway vehicles. 3,746,111, Cl. 177-163.000.

Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, to Rousset-UCLAF. Herbicidal compositions of new urea and thiourea derivatives. 3,746,529, Cl. 71-88.000.

Bertone, Pier Felice; Golzio, Pier Giorgio; and Vrola, Vincenzo, to RIV-SKF Officine di Villar Perosa S.p.A. Device for evaluating the vibrations of a revolving member. 3,745,815, Cl. 73-71.400.

Bessemer Securities Corporation: *See—*
Kahle, Rolf D.; Studey, David K.; and Bryson, James D., 3,746,444.

Bete Fog Nozzle, Inc.: *See—*
Bete, John U.; and Burnham, Richard C., 3,746,262.

Bete, John U.; and Burnham, Richard C., to Bete Fog Nozzle, Inc. Spray nozzle. 3,746,262, Cl. 239-458.000.

Bethlehem Steel Corporation: *See—*
Nothstein, Willard D., 3,745,943.

Bett, Bruce D.: *See—*
Blake, Lawrence W.; Bett, Bruce D.; and Lieber, Clement E., 3,746,003.

Bewley, Thomas; Cooke, Maurice Dudley; and Wirth, Max Marin, to BP Chemicals Limited. Phenol plant effluent treatment. 3,746,639, Cl. 210-18.000.

Beyleveld, Wilhelmus M.: *See—*
Oxenrider, Bryce C.; Woolf, Cyril; and Beyleveld, Wilhelmus M., 3,746,952.

Biach, John L. Torqueing device. 3,745,858, Cl. 81-57.039.

Bianca, Edorado Guiseppe. Load transfer device. 3,746,191, Cl. 214-16.1cc.

Bianchi, Nereo, to Necchi S.p.A. Automatic apparatus for making welted pockets. 3,745,946, Cl. 112-65.000.

Binda, Frederick J.: *See—*
Bachelder, Albert J.; and Binda, Frederick J., 3,746,594.

Binder, Rudolf: *See—*
Andres, Rudolf; Kolle, Erwin; and Binder, Rudolf, 3,746,393.

Bing, Herbert A.; Brayton, Christopher; and Rubinstein, Leon, to Polaroid Corporation. Low-cost roller-type photographic fluid spreading apparatus. 3,745,904, Cl. 95-89.000.

Bio-Lab, Inc.: *See—*
Bloom, Marshall E.; and Walz, David K., 3,746,170.

Bio-Medical Systems, Inc.: *See—*
Rose, Frank L., 3,745,998.

Bio-Pure, Inc.: *See—*
Gensman, Lee R.; and Nunn, Jack R., 3,746,638.

Birckhead, Lennox, Jr.; Evans, Charles P.; and Olsen, Alden W., to Vitek Research Corporation. Conveyor belt construction. 3,745,846, Cl. 74-23.00r.

Blach, Josef. Mixing of materials. 3,746,319, Cl. 259-192.000.

Black, John Dennis. Method and apparatus for picking up litter. 3,746,099, Cl. 171-63.000.

Black, Sivalls & Bryson, Inc.: *See—*
Arenson, Edwin M., 3,746,079.

Blackburn, Keith, to Franklin Equipment Company. Tree harvester. 3,746,064, Cl. 144-309.0ac.

Blair Manufacturing Co., Inc.: *See—*
Ryan, Kelly P., 3,745,790.

Blake, Lawrence W.; Bett, Bruce D.; and Lieber, Clement E., to American Hospital Supply Corporation. Multi-lumen balloon catheter. 3,746,003, Cl. 128-349.00b.

Blakely, Roger W., Jr.: *See—*
Stiles, John C.; Tuffias, Robert H.; and Blakely, Roger W., Jr., 3,746,407.

Blardinelli, Albert J.: *See—*
Salyer, Ival O.; and Blardinelli, Albert J., 3,746,683.

Blenkarn, Kenneth A., to Amoco Production Company. Configurations for ice-resistant platforms. 3,745,777, Cl. 61-46.000.

Blomgren, Oscar C., Jr.: *See—*
Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., 3,746,069.

Blomgren, Oscar C., Sr.; and Blomgren, Oscar C., Jr., to Tuxco Corporation. Tire changing apparatus and method for handling run flat tires. 3,746,069, Cl. 157-1.260.

Bloom, Joseph Lewis, to Lucas, Joseph, (Industries) Limited. Fuel control apparatus for gas turbine engines. 3,745,767, Cl. 60-39.28t.

Bloom, Marshall E.; and Walz, David K., to Bio-Lab, Inc. Liquid treatment apparatus. 3,746,170, Cl. 210-198.000.

Blose, James H.; and Talvalkar, Shashikant G., to National Cash Register Company, The. Heat sensitive record material. 3,746,675, Cl. 260-23.0em.

Blythe, Hugh M.: *See—*
Miller, Arthur F.; Shaw, Wilfrid G.; and Blythe, Hugh M., 3,746,657.

Bobbitt, Barton D. Matrix layout board for making multi-character film chips. 3,746,445, Cl. 355-40.000.

Bode, Wolfgang W.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,746,420.

Bodendoerfer, Raymond E., to Paper Machinery Corporation. Blank wrapping mechanism and method for frusto-conical cup-making machines. 3,745,891, Cl. 93-36.100.

Boehm, Karl W., Sr., to Goodyear Tire & Rubber Company, The. Grinder for rubber sleeves. 3,745,728, Cl. 51-145.00t.

Boeing Company, The: *See—*
Coffey, Charles S.; Gornstein, Robert J.; and Shultz, William M., 3,745,959.

Boerger, Frank E.; and White, William H., Jr., to International Business Machines Corporation. Flow control and monitoring system. 3,746,037, Cl. 137-487.500.

Boivin, Louis-Philipp: *See—*
Kosman, Karel Jan Williams; Boivin, Louis-Philipp; and Fefer, Dennis, 3,746,853.

Boixader, Daniel, to Colgate-Palmolive Company, mesne. Detergent washing composition. 3,746,646, Cl. 252-95.000.

Bok, Lowell D.; and Thrower, Arthur J., to Goodwich, B. F., Company, The. Friction disc member for brake or clutch. 3,746,139, Cl. 192-107.00r.

Bokerman, Gary N.: *See—*
Atwell, William H.; and Bokerman, Gary N., 3,746,732.

Boleky, Edward Joseph, III, to RCA Corporation. Fabrication of semiconductor devices. 3,745,647, Cl. 29-571.000.

Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Schoneborn, Hellmuth, 3,746,288.

Bolt, Murray H.; and Uberbachek, Edward C., to International Business Machines Corporation. Directional coupler switch wherein stripline ground conductor is moved relative to stripline coupling conductors. 3,747,027, Cl. 333-7.000.

Booth, Llewellyn Delphin: *See—*
Neal, Gerald Wayne; and Booth, Llewellyn Delphin, 3,746,666.

Booth, Robert Ben, to American Cyanamid Company. Method of maintaining aqueous suspension of fluidized solids in cooling system. 3,746,641, Cl. 210-58.000.

Bopp and Reuther GmbH: *See—*
Matthias, Karl, 3,746,304.

Borcherding, Karl, to Heye, Herman, Obernkirchin Allec. Honing apparatus. 3,745,715, Cl. 51-92.00r.

Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., to SCM Corporation. Substituted phenyl ethers and thioethers as insect repellents. 3,746,768, Cl. 424-330.000.

Boretti, Napoleon P., to General Motors Corporation. Fluid operated linear motor. 3,745,888, Cl. 92-9.000.

Borg-Warner Corporation: *See—*
Van Camp, Robert L.; and Phillips, Bernard C., 3,746,320.

Boricheski, Joseph, to Johnson & Johnson. Plaster of Paris composition. 3,746,680, Cl. 260-29.2ep.

Boris, Michel, to Societe Technique de Pulverisation. Atomizers. 3,746,260, Cl. 239-321.000.

Born, Kurt; Neuhoff, Kurt-Walter; and Wesemann, Karl Friedrich, to Mannesmannrohren Werke G.m.b.H. Multi-layer pipe. 3,746,050, Cl. 138-150.000.

Borner, Gerhard, to Bosch, Robert, Photokino G.m.b.H. Motion picture camera with fading means. 3,746,436, Cl. 352-91.000.

Borns, David R., to Lear Siegler, Inc. Suspension for land vehicles. 3,746,363, Cl. 280-124.00a.

Borsing, Ebbe Bruno, to Borsing Modeller AB. Triangular crotches for trousers. 3,745,589, Cl. 2-227.000.

Borsing Modeller AB: *See—*
Borsing, Ebbe Bruno, 3,745,589.

Bosch, Paul, to Bosch, Robert, G.m.b.H. Hydraulic control apparatus for a hydraulic machine. 3,746,115, Cl. 180-66.00r.

Bosch, Robert, G.m.b.H.: *See—*
Bosch, Paul, 3,746,115.
Haag, Robert; Haupt, Albert; and Mayer, Siegfried, 3,745,854.
Haubner, Georg; and Hofer, Walter, 3,746,901.
Hohne, Gerd, 3,745,985.
Kuhdorf, Gunther; and Berndt, Joachim, 3,746,632.
Zechnall, Richard; Schmidt, Peter; and Wahl, Josef, 3,745,768.

Bosch, Robert, Photokino G.m.b.H.: *See—*
Borner, Gerhard, 3,746,436.

Boucaud, Andre Jean. Extensible structure. 3,745,725, Cl. 52-67.000.

Bouix, Henri: *See—*
Jampy, Pierre; Bouix, Henri; and Armand, Rene, 3,745,878.

Boutin, Henri P.: *See—*
Sachs, Reynold M.; Boutin, Henri P.; and Cicchiello, Frank, 3,746,793.

Bowen, Omer: *See—*
Heinig, Richard H.; and Bowen, Omer, 3,745,793.

Bowers, Brian Alfred: *See—*
McIntosh, Ian Arthur; Bowers, Norman Josh; and Bowers, Brian Alfred, 3,746,104.

Bowers, Norman Josh: *See—*
McIntosh, Ian Arthur; Bowers, Norman Josh; and Bowers, Brian Alfred, 3,746,104.

Bowler, William: *See—*
Berthiaume, Pierre P.; Bowler, William; Cass, George Robert; Schotman, Jan; Scott, J. Frank; and Thivierge, Jacques, 3,746,111.

Boyert, David L.: *See—*
Thompson, Stanley P.; and Boyert, David L., 3,745,942.

Boyle, Donald A., to Robertshaw Controls Company. Control system having vibration-responsive means and a vibration-responsive unit for such system or the like. 3,746,028, Cl. 137-38.000.

BP Chemicals Limited: *See—*
Bewley, Thomas; Cooke, Maurice Dudley; and Wirth, Max Marin, 3,746,639.

Brabander, Herbert Joseph: *See—*
Wright, William Blythe, Jr.; and Brabander, Herbert Joseph, 3,746,708.

Brackett, Bobby H.; and Jaynes, Charles A., to Bacon, Charles H., Company, mesne. Apparatus for pneumatically tensioning and collecting circular knit hosiery articles. 3,745,794, Cl. 66-149.00s.

Bradley, Arthur S., to Applied Power Industries, Inc. Hydraulic pump. 3,746,476, Cl. 417-269.000.

Bradley, Theodore. Disposable hospital patients gown with cohesive-adhesive applied so the areas of application have space therein free of cohesive-adhesive. 3,745,587, Cl. 2-114.000.

Brady, John F., to Universal Technology, Inc. Pushbutton cantilevered leaf spring contact switch assembly for keyboard type switch arrays. 3,746,816, Cl. 200-159.00a.

Bramhall, Otis H.: *See—*
Siegfriedt, Ernest E., Jr.; and Bramhall, Otis H., 3,746,583.

Brandstatter, Hans G., to Ontario Research Foundation. Direct reduction process for making titanium. 3,746,535, Cl. 75-84.500.

Brandt, Edison R.; and Skurski, James K., to Polaroid Corporation. Flash socket assembly. 3,745,895, Cl. 95-11.00r.

Branen, Leonard A.: *See—*
Hall, Larry E.; Branen, Leonard A.; and Moore, Glen F., 3,746,100.

Brass, John R. Tangent plane light reflector luminaire. 3,746,854, Cl. 240-41.360.

Bratt, Harold F.: *See—*
Vogel, Ralph A.; and Bratt, Harold F., 3,745,807.

Braunschweigische Maschinenbauanstalt: *See—*
Schneider, Ferdinand; Reinefeld, Erich; and Dietzel, Walter, 3,746,576.

Braverman, Maynard, mesne: *See—*
Fisher, William J., 3,745,639.

Bray, Andrew M., to Magna-Graphics Corporation. Coating roll. 3,745,626, Cl. 29-129.000.

Bray, Donald T., to Desalination Systems, Inc. Water purification system for small reverse osmosis unit with integral blowdown water disposal. 3,746,640, Cl. 210-23.000.

Brayton, Christopher: *See—*
Bing, Herbert A.; Brayton, Christopher; and Rubinstein, Leon, 3,745,904.

Brean, John W.; and Mathevosian, Ervand, to Baldwin, D. H., Company. Impulse-operated, day-night, rear view mirror. 3,746,430, Cl. 350-281.000.

Brems, John Henry. Reciprocating drive mechanism. 3,745,838, Cl. 74-27.000.

Brems, John Henry. Force transferring and multiplying system. 3,745,842, Cl. 74-110.000.

Breston, Michael P.: *See—*
Mott, James D., 3,746,097.

Bricker, John K.: *See—*
Mandula, Joseph M., Jr.; Fox, John B.; and Bricker, John K., 3,746,972.

Bridges, Roy G. Toothbrush container. 3,746,162, Cl. 206-15.10e.

Briggs, Aubrey C., to Dravo Corporation. Bulk material handling apparatus. 3,746,150, Cl. 198-233.000.

Bright, James A., to General Motors Corporation. Harvesting mechanism for automatic ice maker. 3,745,779, Cl. 62-135.000.

Brink, Robert V.: *See—*
Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, 3,746,491.

British Iron and Steel Research Association, The: *See—*
Veltze, Stanislaw Marian; and English, Paul Everitt, 3,745,834.

British Steel Corporation: *See—*
Armstrong, David Alun, 3,745,833.

Broad, Michael John; and Moss, Norman, to Plessey Handel und Investments A.G. Fuel-injection systems, more particularly for liquid-fuel burners. 3,746,257, Cl. 239-102.000.

Brock, Kenneth D.: *See—*
Stoakes, Donald S.; and Brock, Kenneth D., 3,746,974.

Brocklehurst, Charles E., to Riegel Textiles Corporation. Diaper machine. 3,745,947, Cl. 112-121.110.

Brodof, Terry A.: *See—*
Browne, Colin L.; and Brodof, Terry A., 3,746,507.

Brody, Stanley S.: *See—*
Gessaroli, Joseph; and Brody, Stanley S., 3,746,969.

Brophy, Ira N.; and Felsenthal, Donald, to Whitmor Manufacturing Co., Inc. Garment bag. 3,746,151, Cl. 206-7.00k.

Bross, William T.: *See—*
Lackey, Ray R.; and Bross, William T., 3,746,814.

Brougher, Jack L. Navigational aid for receiving sound signals. 3,747,057, Cl. 340-16.00r.

Brown, Boveri & Cie, Aktiengesellschaft: *See—*
Iten, Paul; and Mastner, Jiri, 3,747,025.

Brown, Christopher Robert; George, Terence Malcolm; and Norton, David John, to Westinghouse Brake and Signal Company Limited. Static circuit arrangement. 3,746,942, Cl. 317-148.50r.

Brown, Harry W., to Cutler-Hammer, Inc. Lock-off switch. 3,746,813, Cl. 200-157.000.

Brown, Paul W.: *See—*
Endicott, Clarence J.; Brown, Paul W.; and Andrews, Leonard S., 3,746,554.

Brown, Roger Henry: *See—*
Beeli, Johann Battesta; Brown, Roger Henry; and Reif, Philip George, 3,746,903.

Brown, Samuel E., Jr., to Lee, Raymond, Organization, Inc., The. Harmless firework. 3,745,691, Cl. 42-55.000.

Browne, Colin L.; and Brodof, Terry A., to Celanese Corporation. Solvent dyeing copolyester fibers. 3,746,507, Cl. 8-174.000.

Browne, Frederick S.: *See—*
Budzich, Tadeusz; and Browne, Frederick S., 3,746,301.

Brownlee, Winston E. Fishing device. 3,745,688, Cl. 43-43.120.

Bruce, Allan L.: *See—*
Bruce, Lester E.; and Bruce, Allan L., 3,746,366.

Bruce, Lester E.; and Bruce, Allan L. Flexible trailer splash and stone shield. 3,746,366, Cl. 280-154.50r.

Bruce, William F., to American Home Products Corporation. 2,6-Dichlorobenylidenehydrazides. 3,746,703, Cl. 260-562.00h.

Bruce, William F., to American Home Products Corporation. N-substituted-5,6,7,8-tetrahydro-7-methylnaphtho-(2, 3-D)-1,3-di oxole-5,6-dicarboximides. 3,746,715, Cl. 260-293.580.

Bruckner-Apparatel u GmbH: *See—*
Schuierer, Manfred, 3,745,666.

Brundage, Horace W.: *See—*
Bayless, Frank K.; Brundage, Horace W.; Evans, Robert A.; and Hoover, John W., 3,745,603.

Brundage, Robert S.: *See—*
Gant, Preston L.; Motes, Bill G.; and Brundage, Robert S., 3,746,861.

Bruner, James N.; and McAuliff, Dan, to Sangamo Electric Company. Remote meter reading system for KWH watthour meters and demand meters. 3,747,068, Cl. 340-151.000.

Brunetz, Nickolas; and Haskell, Robert A., to Aerojet-General Corporation. Sterilization of nitroparaffin-amine explosives. 3,746,588, Cl. 149-89.000.

Bryant, Herbert William: *See—*
Austin, Thomas Charles; and Bryant, Herbert William, 3,746,898.

Bryson, James D.: *See—*
Kahle, Rolf D.; Studey, David K.; and Bryson, James D., 3,746,444.

BTR "Pamukotex": *See—*
Petrov, Gueorgui Mitov, 3,745,764.

Buchanan, Edward R.; and Tarshis, Lemuel A., to Gencral Electric Company. Precipitation hardenable ferritic iron-chromium-titanium alloys. 3,746,586, Cl. 148-37.000.

Buchheit, Otto Karl, to Moeller & Neumann G.m.b.H. Cooling beds. 3,746,146, Cl. 198-219.000.

Buck, Robert. Power supply for oscillator circuit of contactless proximity indicator. 3,747,010, Cl. 331-65.000.

Buck, Robert. Metal detector including proximity-responsive oscillator with feedback-stabilized gain. 3,747,011, Cl. 331-65.000.

Buck, Robert. Contactless oscillator-type proximity sensor with adjustable hysteresis. 3,747,012, Cl. 331-65.000.

Buczek, Carl J., to United Aircraft Corporation. Magnetic stabilized cross field flowing gas laser. 3,747,015, Cl. 331-94.500.

Budd, Wilbert N.: *See—*
Van Benthuysen, John D.; Budd, Wilbert N.; and Cormican, Robert E., 3,747,043.

Budzich, Tadeusz; and Browne, Frederick S., to Weatherhead Company, The. Valve stem friction device. 3,746,301, Cl. 251-64.000.

Buerger, Herbert, to Del-Met Corporation. Wheel trim assembly. 3,746,397, Cl. 301-37.00r.

Buerger, Herbert. Wheel trim and lock ring assembly. 3,746,398, Cl. 301-37.00r.

Buffington, Herman L. Device for mixing gases with liquid. 3,746,323, Cl. 261-122.000.

Buhren, Heinz: *See—*
Anderheggen, Manfred; and Buhren, Heinz, 3,746,212.

Bukatova, Vera Evgenievna: *See—*
Ageev, Vladimir Egorovich; Bukatova, Vera Evgenievna; and Dmitriev, Oleg Alexandrovich, 3,746,941.

Bull, Hans: *See—*
Welzel, Josef; Bull, Hans; and Maykemper, Alfred, 3,745,772.

Bullas, Roy. Automated store system. 3,746,130, Cl. 186-1.00b.

Bunce, Robert C.: *See—*
United States of America, National Aeronautics and Space Administration, 3,746,998.

Bunk, Carl P.: *See—*
Junk, Thomas A.; and Bunk, Carl P., 3,745,866.

Bunker, Kenneth James; and Wright, Martin Ronald, to Alford & Alder (Engineers) Limited. Servo valves. 3,746,045, Cl. 137-625.240.

Bunker Ramo Corporation: *See—*
Knitter, Heinz Wolfgang; and Veszelik, Josef, 3,746,933.

Bunyan, Thomas Walter, to P & O Pilgrim Valve Limited. Mounting of propellers on shafts. 3,746,470, Cl. 416-244.000.

Burch, Arthur R.; and Bates, Charles E., to Clark Equipment Company. Automatic control system for storage systems transfer cart. 3,746,189, Cl. 214-16.40b.

Burch, James L., to Fiber Industries, Inc. Threadline defect detector. 3,746,865, Cl. 250-219.00s.

Buren Watch Company S.A.: *See—*
Kocher, Hans; and Schmied, Peter, 3,745,762.

Burger, Heinz: *See—*
Reicheneder, Franz; Dury, Karl; Krusche, Georg; and Burger, Heinz, 3,746,726.

Burgess, Douglas P.; and Williams, Gilmer A., to Cannon Mills Company. Method and apparatus for feeding terry warps in looms. 3,746,052, Cl. 139-25.000.

Burgess, Warren C., Jr. Vibratory quantifying apparatus. 3,746,211, Cl. 221-7.000.

Burklund, Glenn A. Methods for texturizing yarns and the like. 3,745,618, Cl. 28-72.100.

Burnham, Peter B.: *See—*
Jones, Roger D.; and Burnham, Peter B., 3,746,403.

Burnham, Richard C.: *See—*
Bete, John U.; and Burnham, Richard C., 3,746,262.

Burns, William A., Jr.: *See—*
Pierce, Aaron E.; Burns, William A., Jr.; Cooke, Claude E., Jr.; Hillestad, Jerry G.; and Spillette, Arthur G., 3,745,822.

Burroughs Corporation: *See—*
Stopper, Herbert, 3,746,885.

Burstein, Ely. Slide fasteners. 3,745,636, Cl. 29-207.5sl.

Burwood Products Company: *See—*
Faust, Emil, 3,745,680.

Buse, Frederic W., to Ingersoll-Rand Company. Toothed shroud centrifugal impeller. 3,746,467, Cl. 416-186.000.

Byrd, Paul S.: *See—*
Marshall, Clifford D.; Byrd, Paul S.; and Dante, Mark F., 3,746,686.

C-R-O Engineering Co., Inc.: *See—*
Wirth, Jon K.; and Balfane, Frederick J., 3,746,326.

Caillat, Maurice; and Perrin, Georges, to L'Air Liquido, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Cooling apparatus with conveyor. 3,745,784, Cl. 62-380.000.

Cairns, Robert Lacock; and Benjamin, John Stanwood, to National Nickel Company, Inc., The. Zone annealing in dispersion strengthened materials. 3,746,581, Cl. 148-11.50f.

Calgon Corporation: *See—*
Urbanic, John E., 3,746,655.

California Computer Products, Inc.: *See—*
Smith, William E., 3,746,447.

Camerik, Eduard, to U.S. Philips Corporation. Stylus securing device. 3,746,347, Cl. 274-37.000.

Cameron, Frank L., to Westinghouse Electric Corporation. Current limiting fuse with improved fuse elements. 3,747,041, Cl. 337-159.000.

Cameron, John F., to Hatch Associates Ltd. Journal bearing. 3,746,410, Cl. 308-72.000.

Camilliere, John, to Elecgro-Nucleonics, Inc. Ultracentrifuge with rotor speed identification. 3,746,247, Cl. 233-1.00b.

Campbell, Donald A.: *See—*
Tait, William C.; Campbell, Donald A.; Packard, James R.; and Dierssen, Gunther H., 3,747,018.

Canadian Industries Limited: *See—*
Murray, Charles Robertson, 3,746,246.

Canadian National Railway Company: *See—*
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Canavesi, Lavinio: *See—*
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Canivenc, Serge, to Societe Lannionnaire d'Electronique. Connection system for waves with variable polarization. 3,747,115, Cl. 343-820.000.

Cannon Mills Company: *See—*
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Canon Kabushiki Kaisha: *See—*
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Canon Kabushiki Kaisha, mesne: *See—*
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Capetti, Federico; and Terzuolo, Giancarlo, to Olivetti, Ing., C., & C., S.p.A. Paper sheet feed control device for printing machines, duplicators and machines for the treatment of sheets in general. 3,746,333, Cl. 271-56.000.

Carabet, George F.; Holland, Andrew M.; Morris, Joseph P.; Pester, William B.; and Pinkerton, Kennteh R., to Mattel, Inc. Visual-effects-producing means in an audio-visual toy. 3,746,439, Cl. 353-19.000.

Carbide Form Grinding, Inc.: *See—*
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Cardwell, John G., Jr., to General Electric Company. Adapter base for electric lamp. 3,746,906, Cl. 313-318.000.

Carl, John M.: *See—*
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Caroleo, Steven J., to Emerson Electric Co. Methods of installing an elongated, flexible, electric heater into a material storage tank, and heater construction for the same. 3,745,640, Cl. 29-433.000.

Caroli, Alberto; and Giuffrida, Giovanni. Disc-like platelet fabric. 3,746,602, Cl. 161-37.000.

Carrier Corporation: *See—*
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Cash, George O., Jr.: *See—*
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Casselman, James S. Dental floss holder and applicator. 3,746,017, Cl. 132-92.00a.
Cavalieri, Bruno; and Lancini, Giancarlo, to Gruppo Lepetit S.p.A. Aminoimidazole derivatives. 3,746,705, Cl. 260-240.00a.
Cavella, James J., to Datadyne Corporation. Digital printer hammer assembly. 3,745,917, Cl. 101-93.00c.
Celanese Corporation: *See—*
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Stautzenberger, Adin Lee; and MacLean, Alexander Fiske, 3,746,750.
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Chaney, Donal W.: *See—*
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Chavany, Jean-Claude, to Societe Anonyme de Telecommunications. Apparatus to impart a circular translatory to a element such as a modulator element. 3,746,422, Cl. 350-6.000.
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Chicago Rawhide Manufacturing Company: *See—*
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Churchfield, John W., to Dow Corning Corporation. Jet dyeing foam control. 3,746,653, Cl. 252-321.000.
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Cipolla, Henry E. Collapsible container. 3,746,203, Cl. 220-6.000.
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Clary, James Barney, to Bell Telephone Laboratories, Incorporated. FFT process and apparatus having equal delay at each stage or iteration. 3,746,848, Cl. 235-156.000.
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Clipp, Louis L.: *See—*
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Coffey, William F.; Coley, Kenneth R.; and McLaughlin, Emmett J., to Westinghouse Electric Corporation. Dielectric housing for electrical conductors in a meter housing. 3,746,936, Cl. 317-120.000.
Cohl, Matthew E. Method of orthodontia. 3,745,653, Cl. 32-14.00a.
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Columbia Broadcasting Systems, Inc.: *See—*
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Corman, James C.; and Walmet, Gunnar E., to General Electric Company. Heat transfer device. 3,746,081, Cl. 165-32.000.
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Costard, Herbert, to Edler & Krische. File card, or the like. 3,745,681, Cl. 40-36.000.
Costarella, Nino F. Ringless piston. 3,745,890, Cl. 92-192.000.
Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Process for improving the color characteristics of antioxidants. 3,746,654, Cl. 252-400.00a.
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Hogg, Walter R., 3,746,977.
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Dalaokis, Eli James; and Shearer, Harry Douglas, to Electronic Communications, Inc. Navigation system utilizing plural commercial broadcast transmissions. 3,747,106, Cl. 343-112.00d.

Dallach, Gerd; Dudszus, Alfred; Fretwurst, Lothar; Granz, Jochen; and Schlottmann, Dietrich, to Veb Dieselmatorenwerk. Adjusting and locking device. 3,746,466, Cl. 416-153.000.

Daly, Richard H.; Brink, Robert V.; and Andersen, Kare, to Chicago Rawhide Manufacturing Company. Injection molding apparatus. 3,746,491, Cl. 425-233.000.

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Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic comparator circuit. 3,747,014, Cl. 331-77.000.

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Davidson, Farris B. Magnet operated toy. 3,745,698, Cl. 46-236.000.

Davidson, James R., to Xerox Corporation. Electrophotographic imaging apparatus. 3,746,442, Cl. 355-3.000.

Davis, Jlee, to Avance Oil & Gas Co., Inc. Multi-directional seismic exploration methods. 3,746,122, Cl. 181-.50r.

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Davis, Thomas L., 10% to Lee, Raymond, Organization, Inc., The. Auxiliary bumper impact protector. 3,746,383, Cl. 293-71.00r.

Dawber, Edmund Norman, to Serck Idustries Limited. Control system for gas pressure regulating apparatus. 3,746,030, Cl. 137-110.000.

De Amicis, Ferdinando. Battery lug cleaning tool. 3,745,622, Cl. 29-78.00r.

De Bella, Sylvester J. Flat filling machine. 3,746,058, Cl. 141-129.000.

De Bretagne, Yves, to Honeywell Inc. Field effect transistor impedance coupling network whose output voltage equals the input voltage. 3,746,893, Cl. 307-304.000.

De Cardenas, Ignacio. Sound-muffling device. 3,746,126, Cl. 181-36.00b.

De Lancey, Warren H.; and Weisman, Donald, to Flood Control Valve Company. Flood control valve and pump assembly. 3,746,473, Cl. 417-.380.

De Nevlu, Lawrence W.: *See—*
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De Nevlu, Lawrence W.; and Connet, Bennet H., to De Nevlu, Lawrence W. and Connet, Bennet H. Coupler. 3,746,377, Cl. 287-2.000.

de Santis, Charles M.: *See—*
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De Shazo, Earl L., Jr., to Phillips Petroleum Company. Signal generating and recording apparatus with time delay. 3,747,060, Cl. 340-18.00p.

De Vellis, Salvatore V., to Raytheon Company. Antenna support and stowage system. 3,747,113, Cl. 343-766.000.

De Vitz, William R., to Structural Foam Products, Inc. Apparatus for molding foamed thermoplastic articles. 3,746,492, Cl. 425-242.000.

De Zeeuw, Jan Willem: *See—*
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Dean, Carl J.; and Wright, David M., to Wright, Barry, Corporation. Portable forms support. 3,746,296, Cl. 248-441.000.

Deaton, David W., to Deaton Medical Company. Medical suction method and apparatus. 3,745,999, Cl. 128-277.000.

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Decker, Herbert, to Triumph Werke Nuernberg, A.G. Shift device for positioning single element type carriers on typewriters and like machines. 3,746,141, Cl. 197-16.000.

Deckert, Fred W.; and Matson, Gale W., to Minnesota Mining and Manufacturing Company. Fasteners and sealants useful therefor. 3,746,068, Cl. 151-14.500.

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Deibel, Raymond A.; and Riester, William C., to Trico Products Corporation. Adjustable connecting arm. 3,745,853, Cl. 74-586.000.

Dejur-Amsco Corporation: *See—*
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Del-Met Corporation: *See—*
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Delamater, William B. Roasting spit. 3,745,910, Cl. 99-419.000.

Dellecave, Thomas L.: *See—*
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Demi, Roy C., to Robertshaw Controls Company. Fuel control device mounting arrangement with a fuel supply manifold. 3,746,039, Cl. 137-561.00r.

Dennis, Paul A.; and Schrader, William A., to Ex-Cell-O Corporation. Tape transport control system. 3,746,278, Cl. 242-190.000.

Dentsply International Inc.: *See—*
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DePontac, Jean-Marie Joseph. Carburetor. 3,746,321, Cl. 261-50.00a.

Derringer, George C.: *See—*
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Devine, Walter B., to Esso Research and Engineering Company. Tanker vessel. 3,745,960, Cl. 114-14.00r.

Dick, Clarence R.; and Ward, Eldon L., to Dow Chemical Company, The. Amine-modified polyalkylene oxides. 3,746,678, Cl. 260-2.00a.

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Diener, Robert G.; Reeder, Randall C.; and Shoemaker, Harold D., to Waycrosse, Inc. Belt fertilizer spreader. 3,746,264, Cl. 239-668.000.

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Dietze, Wolfgang; Reuschel, Konrad; and Sandmann, Herbert, to Siemens Aktiengesellschaft. Device for producing tubular bodies of semiconductor material, preferably silicon or germanium. 3,746,496, Cl. 425-447.000.

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Dobinson, Bryan; Stark, Bernard Peter; and Young, Eric Whichell, to Ciba-Geigy AG. Curable mixture of epoxide resins and polymercaptans. 3,746,685, Cl. 260-47.0ec.
Dobson, James J.; Dellecave, Thomas L.; Donegen, Rudolf R.; and Miller, John R., to United States of America, Air Force. Intervalometer for parachute flare launcher. 3,745,877, Cl. 89-28.000.
Dochterman, Richard W.; and Yeaman, David H., Jr., to General Electric Company. Dynamoelectric machine vibration isolator mounting. 3,746,894, Cl. 310-51.000.
Dodge, Harry G., to Crawford Fitting Company. Measuring device. 3,745,663, Cl. 33-173.000.
Dodson, Marshall: *See—*
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Doerge, Herman P.; and Wismer, Marco, to PPG Industries, Inc. Urethane foams with reduced smoke levels and improved flame spread. 3,746,664, Cl. 260-2.5am.
Doherty, George O. P., to Lilly, Eli, and Company. N-(2,2-Difluoroalkanoyl)-2,3-pyridinediamine compounds. 3,746,531, Cl. 71-94.000.
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, to Matsushita Denko Kabushiki Kaisha. Method of manufacturing electric surface heaters. 3,745,649, Cl. 29-611.000.
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Donatelli, Joseph. Electrical power plant driven by ocean waves and tides. 3,746,875, Cl. 290-42.000.
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Driskell, Carl R., to United States of America, Navy. Shrunken raster with image insetting. 3,746,782, Cl. 178-6.850.
Drown, John L.; and Peppel, Howard C., to Westinghouse Electric Corporation. Metal-enclosed switchgear. 3,746,817, Cl. 200-168.00k.
Drucker, Gerhard; and Filsinger, Reinhard, to Daimler-Benz Aktiengesellschaft. Fog rear light. 3,746,918, Cl. 315-77.000.
Drugmand, Lester D., to Emerson Electric Co. Electric heating elements. 3,746,838, Cl. 219-512.000.
Druschel, William O.; Karsch, Arthur F.; and Schneider, William C., Jr., to International Business Machines Corporation. Mask bit error indicator. 3,745,897, Cl. 95-12.000.
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Eigenmann, Ludwig. Reflective road marking means and aggregate. 3,746,425, Cl. 350-109.000.
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Eisele, Hermann; and Lewis, Robert R., to Westinghouse Electric Corporation. Control system for individually driven vehicles in a train of such vehicles. 3,745,933, Cl. 105-61.000.
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Elliott, Robert E., to FWI, Inc. Pump station. 3,746,027, Cl. 137-1.000.
Ellis, Robert. Foot-ball game employing a number of balls equal to the number of goals. 3,746,340, Cl. 273-95.00h.
Ellis, Rollo G.; and Ditty, Allan V., 1/3 to Gilleran, Gerald T. Nail extracting device. 3,746,306, Cl. 254-19.000.
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Erickson, Wayne D.; and Sullivan, Edward M., to United States of America, National Aeronautics and Space Administration. Ablation article and method. 3,745,816, Cl. 73-86.000.
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Fabriques de Produits Chimiques de Thann et de Mulhouse: *See—*
Michaud, Andre Louis, 3,746,516.
Fagiano, Carl R. Key container. 3,745,799, Cl. 70-456.00r.
Fair, Delbert W.; and Miller, J. H., Jr., to Continental Oil Company. Hydraulic vibrator. 3,745,885, Cl. 91-216.00b.
Fairchild Industries, Inc.: *See—*
Earl, Webster B., 3,745,819.
Falk, David O.: *See—*
Norton, Charles J.; and Falk, David O., 3,746,094.
Falkowski, Edmund W.: *See—*
Mertz, Dale H.; Loeb, Alfred A.; and Falkowski, Edmund W., 3,745,926.
Faraon, Jorge C.; and Zakka, Chaul. Interchangeable valve seat assembly. 3,746,305, Cl. 251-360.000.
Farber, Sheldon; and Wright, Arthur John, to National Cash Register Company, The. Pressure sensitive record sheet employing alkyl or halo substituted tetrahalofluorans. 3,746,563, Cl. 117-36.200.
Farbwreke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Schuierer, Erich; Hoffmann, Dieter; and Rebsoat, Siegfried, 3,746,742.
Farkas, Paul; and Hidassy, Laszlo, to Thomas & Betts Corporation. Ejecting means. 3,746,055, Cl. 140-93.200.
Farmer Foundation Company: *See—*
Farmer, Glyen D.; and Owens, J. C., 3,746,105.
Farmer, Glyen D.; and Owens, J. C., to Farmer Foundation Company. Arm extension for drilling foundation holes. 3,746,105, Cl. 173-44.000.
Farr, Alton E.; Welch, Graydon L.; and Wood, Lorin A., to McDonnell Douglas Corporation. Control wheel steering device. 3,746,284, Cl. 244-83.00e.
Fasching, George E.; and Patton, George H., to United States of America, Atomic Energy Commission. Pulse processing system. 3,747,001, Cl. 328-116.000.
Fasco Industries, Inc.: *See—*
Hire, Charles John, 3,747,039.
Faust, Emil, to Burwood Products Company. Picture frame assembly. 3,745,680, Cl. 40-152.000.
Faustini, Franco: *See—*
Parisi, Franco; Faustini, Franco; and Canavesi, Lavinio, 3,746,700.
Fawkes, Donald G., to Pratt, Henry Company. Emergency manual drive for valve operators. 3,745,855, Cl. 74-625.000.

Fearing, Ralph B.: *See—*
Weil, Edward D.; Fearing, Ralph B.; and Eisenberg, Bernard J., 3,746,572.

Fechter, Henry G., to Teletype Corporation. Laser writing. 3,747,117, Cl. 346-1.000.

Fefer, Dennis: *See—*
Kosman, Karel Jan Williams; Boivin, Louis-Philipp; and Fefer, Dennis, 3,746,853.

Feichtner, John D.; Gottlieb, Milton; and Roland, George W., to Westinghouse Electric Corporation. Acousto-optical systems. 3,746,866, Cl. 250-77.000.

Feinbloom, Richard E., to Designs for Vision, Inc. Surgical headlight. 3,745,993, Cl. 128-23.000.

Feller, Raymond L.; and Franklin, David W., to United States Steel Corporation. Strip uncoiling device. 3,746,229, Cl. 226-91.000.

Fellman, Frederick J.: *See—*
Wachter, Vincent C.; Keller, Joseph R.; and Fellman, Frederick J., 3,746,408.

Felsenthal, Donald: *See—*
Brophy, Ira N.; and Felsenthal, Donald, 3,746,151.

Fenne, Kenneth R., to Motorola, Inc. Sound balancing apparatus. 3,746,788, Cl. 179-1.0gq.

Fenske, Horst, to VEB Polygraph Leipzig. Method and apparatus for initiating counting and/or disconnecting processes, in particular for printing presses. 3,746,841, Cl. 235-92.0pk.

Ferrieu, Gilbert Marie Marcel: *See—*
Le Diberder, Michel Alain Rene; Ferrieu, Gilbert Marie Marcel; and Hamel, Roger Bernard Jules, 3,746,990.

Fey, Maurice G.; Wolf, Charles B.; Azinger, Frederick A., Jr.; and Kemeny, George A., to Westinghouse Electric Corporation. Recurrent arc heating system. 3,746,830, Cl. 219-121.00p.

Fiber Industries, Inc.: *See—*
Burch, James L., 3,746,865.
Whisant, John K., 3,746,275.

Fichter, Walter; Armbruster, Otto; and King, Josef, to Gebruder Junghans G.m.b.H., Firma. Track mounted rail and adjustable starting block therefor. 3,746,335, Cl. 272-59.00a.

Field, Thomas R., to Jenn-Air Corporation. Broiler with heat sink means. 3,745,912, Cl. 99-446.000.

Fieldhome Equipment Corporation: *See—*
Robinson, Merritt A., 3,746,388.

Fillion, Paul-Henri; and Guay, Viateur, to Hoplab Inc. Washing machine for medical and laboratory equipment. 3,746,022, Cl. 134-141.000.

Filsinger, Reinhard: *See—*
Drucker, Gerhard; and Filsinger, Reinhard, 3,746,918.

Finch, Neville: *See—*
Werner, Lincoln Harvey; and Finch, Neville, 3,746,724.

Fine, Maynard W., to Nuwood Game, Inc. Word forming game apparatus. 3,746,342, Cl. 273-135.00d.

Finefrock, Donald W.: *See—*
Sudyk, John R.; and Finefrock, Donald W., 3,746,414.

Finkel, Nathan B., to Swift Sheetmetal Corporation. Multi-blade damper. 3,746,042, Cl. 137-601.000.

Fiorino, Benjamin C.: *See—*
Bailey, David L.; Fiorino, Benjamin C.; and Rodriguez, Juan A., 3,747,079.

Firearm Development, Inc.: *See—*
Koon, Homer E., Jr., 3,745,683.
Koon, Homer E., Jr., 3,745,686.
Koon, Homer E., Jr., 3,745,687.

Fischer & Porter Co.: *See—*
Mannherz, Elmer D.; and Yard, John S., 3,745,824.

Fischer, Artur: *See—*
Fischer, Artur; Porlein, Gerhard; and Schmidt, Erich, 3,745,736.

Fischer, Artur; Porlein, Gerhard; and Schmidt, Erich, to Fischer, Artur. Composite wall construction. 3,745,736, Cl. 52-511.000.

Fischer, Erwin: *See—*
Mischo, Klaus; Rammesberger, Karl; and Fischer, Erwin, 3,746,234.

Fisher, Carl B.: *See—*
Erhart, Francis J.; and Fisher, Carl B., 3,746,502.

Fisher, Ernest P., Jr.: *See—*
Read, Norman W.; and Fisher, Ernest P., Jr., 3,746,090.

Fisher, Wesley H. Boat structure. 3,745,963, Cl. 115-34.00r.

Fisher, William J., 50% ts Braverman, Maynard, mesne. Method for processing flexible metallic conduit. 3,745,639, Cl. 29-417.000.

Fitch, Richard A.; and Crewson, Walter F. J., to Maxwell Laboratories, Inc. Marx generator and triggering circuitry therefor. 3,746,881, Cl. 307-110.000.

Fitzgerald, Maurice J.; and Taylor, Lloyd D., to Polaroid Corporation. Silver halide emulsion with graft copolymer binders. 3,746,548, Cl. 96-113.000.

Fitzsimons, Alan R.; and Mazac, Frank P., to San Bar Electronics Corporation. Long line adapter circuit usable with increased power supply. 3,746,795, Cl. 179-16.00f.

Fitzwater, Edwin, to General Signal Corporation. Tool for cleaning and raking shag type rugs. 3,745,604, Cl. 15-397.000.

Flamholz, Alexander L., to International Business Machines Corporation. Dimensional measurement technique using optical filtering. 3,746,455, Cl. 356-168.000.

Flangeklamp Corporation: *See—*
Sauer, Gale E., 3,746,379.

Flatley, James P., to United States of America, Navy. Lightweight xenon lamp igniter. 3,746,920, Cl. 315-170.000.

Fleming Metal Fabricators: *See—*
Fleming, Robert T., 3,745,796.

Fleming, Robert T., to Fleming Metal Fabricators. Lock assembly for metal box. 3,745,796, Cl. 70-81.000.

Fletcher-Jones, David Francis: *See—*
Hill, Harold Taylor; and Fletcher-Jones, David Francis, 3,745,889.

Flider, Frank S., to Justrite Manufacturing Company. Plastic jerry can. 3,746,200, Cl. 215-10.000.

Flood Control Valve Company: *See—*
De Lancey, Warren H.; and Weisman, Donald, 3,746,473.

Flynn, Jerome R., to Cutter Laboratories, Inc. Folded cardboard specimen container or urinal. 3,746,240, Cl. 229-14.00b.

Folgner, Claus-Peter. Internal ski rack for automobile. 3,746,224, Cl. 224-42.10c.

Folkers, Karl; and Enzmann, Franz H. Tripeptide having the activity of the thyrotropin releasing hormone. 3,746,697, Cl. 260-112.500.

Folkmann, Eduard: *See—*
Pammer, Erich; and Folkmann, Eduard, 3,746,569.

Ford, Eric Harold, to Lumenition Limited. Device for measuring the speed of a rotating shaft. 3,746,987, Cl. 324-167.000.

Ford, Eric Harold; and Tate, Brian Christopher, to Lumenition Limited. Means for measuring speed or distance. 3,746,988, Cl. 324-175.000.

Ford, Geoffrey Ewart; and Waite, Philip Sidney, to Fords (Finsbury) Limited. Bottle inspection apparatus. 3,746,165, Cl. 209-74.000.

Ford Motor Company: *See—*
Colvin, Alex David; and Warnick, Alan, 3,746,514.
Francis, Reid E.; and Marcuzzi, Anthony T., 3,745,703.
Nordstrom, John D., 3,746,567.
Warnick, Alan; and Colvin, Alex David, 3,746,513.

Ford, Paul A. Elevator having reciprocating plates positioned and driven by rack and pinion structure. 3,746,147, Cl. 198-219.000.

Ford, Peter W.: *See—*
Bala, John L.; and Ford, Peter W., 3,747,085.

Fords (Finsbury) Limited: *See—*
Ford, Geoffrey Ewart; and Waite, Philip Sidney, 3,746,165.

Forster, Karl-Heinz; Vetter, Lothar; Johne, Hans; and Schanze, Klaus, to VEB Polygraph Leipzig Druckmaschinenwerk Planeta Radebeul. Apparatus for remote control of positioning and drive members for printing machines. 3,746,957, Cl. 318-696.000.

Forstner, Josef: *See—*
Zima, Herbert; and Forstner, Josef, 3,746,671.

Foster, George William, to Legg (Industries) Limited. Frequency halving circuits. 3,746,884, Cl. 307-225.00b.

Foster, Hans-Joachim M.; Eltze, Uhrich; and Hensel, Werner, to Daimler-Benz Aktiengesellschaft. Actuating mechanism for friction cluthes in automatic motor vehicle transmissions. 3,746,138, Cl. 192-87.110.

Foster, Leigh Curtis, to Zenith Radio Corporation. Acousto-optical system with simplified optics. 3,746,427, Cl. 350-161.000.

Fourrey, Franscois, to Regie Nationale des Usines Renault. Folding seats for automotive vehicles. 3,746,389, Cl. 297-15.000.

Fowler, John T., to Laitram Corporation, mesne. Digital magnetic compass. 3,746,842, Cl. 235-92.0cv.

Fox, Duane C.; Ichinose, Richard Y.; and Klaus, Tal E., to American Multiples Systems, Inc. Method and apparatus for data transmission. 3,747,067, Cl. 340-147.0sy.

Fox, John B.: *See—*
Mandula, Joseph M., Jr.; Fox, John B.; and Bricker, John K., 3,746,972.

Franchi, Pierre Paul, to L'Electronique Appliquee. Level measuring equipments. 3,745,829, Cl. 73-290.00v.

Francis, Reid E.; and Marcuzzi, Anthony T., to Ford Motor Company. Vehicle window regulator mechanism. 3,745,703, Cl. 49-103.000.

Franke, Rodiger: *See—*
Tax, Hans; and Franke, Rodiger, 3,746,182.

Frankel, Sydney. Winding process and device for one or more strips of flexible material. 3,746,271, Cl. 242-56.00r.

Franklin, David W.: *See—*
Feller, Raymond L.; and Franklin, David W., 3,746,229.

Franklin Electric Co., Inc.: *See—*
Hohman, William H., 3,746,951.

Franklin Equipment Company: *See—*
Blackburn, Keith, 3,746,064.

Fransson, Johnny; Holmlund, Henrik; and Kareby, Erik, to AB Vibro-Verken. Vibrator driven by pressurized fluid. 3,746,310, Cl. 259-1.00r.

Fraser, George R. Hand appliance device and its enclosure. 3,746,960, Cl. 320-2.000.

Fraser, Jack C. W.; Swanke, Raymond R.; and Arbour, Jules E., III, to Dow Chemical Company. Method for the subterranean storage and withdrawal of a liquid. 3,745,770, Cl. 61-.500.

Frederick, Arthur F., to United States of America, Navy. Fluid mixer-dispenser. 3,746,216, Cl. 222-137.000.

Freeberg, Charles A.; and Ganss, Alfred G.; deceased (by Ganss, Shirley; legal representative). Basic oxygen steel making facility and method of oxygen refining of steel. 3,746,325, Cl. 266-13.000.

Freeborn, John C., to Honeywell Inc. High speed amplifier for use with an inductive load. 3,747,006, Cl. 330-30.00d.

Freen, Philip, to Telectron, Inc. Interference avoidance superregenerative receiver. 3,746,999, Cl. 325-429.000.

Freimark, Ronald J.; and Hilssen, Ole K., to Motorola, Inc. Automatic biased controlled amplifier. 3,747,005, Cl. 330-22.000.

French, Raymond J.; Wagner, Richard A.; and Zehr, Richard E., to General Electric Company. Camera tube with accurate field mesh mounting means. 3,746,917, Cl. 313-65.00r.
Fretwurst, Lothar: *See—*
Dallach, Gerd; Dudszus, Alfred; Fretwurst, Lothar; Granz, Jochen; and Schlottmann, Dietrich, 3,746,466.
Frey, Irwin Kenneth; and Zola, Charles L. Food warming appliance. 3,746,837, Cl. 219-387.000.
Frick, Harold L., to Whirlpool Corporation. Self-cleaning oven door holding means. 3,745,988, Cl. 126-273.00r.
Friedland, Harry, to Process Systems, Inc. Fluid flow control system. 3,746,041, Cl. 137-599.000.
Friedman, George, to Lummus Company, The. Two-stage high temperature shift reactor. 3,746,515, Cl. 23-288.00r.
Fries, Hugo: *See—*
Hindel, Hans; and Fries, Hugo, 3,746,483.
Fritz, Thomas W.: *See—*
Davey, John R.; Gilbo, Charles F.; Johnson, Norman A.; and Fritz, Thomas W., 3,745,734.
Frolunda, Vastra: *See—*
Lindstedt, Sven; Treiber, Laszlo; Frolunda, Vastra; Stollnberger, Peter; and Tausch, Walter, 3,746,869.
Frosst, Charles E., & Co.: *See—*
Atkinson, Joseph G.; and Luke, Michael O., 3,746,634.
Frye, George J., to Tektronix, Inc. Time and sequency determining circuit. 3,747,002, Cl. 328-128.000.
Fuhrmann, Robert; and Pisanchyn, John, to Allied Chemical Corporation. Two-step hydrogenation of lysine amide precursors. 3,746,763, Cl. 260-561.00a.
Fuji Photo Film Co., Ltd.: *See—*
Hayakawa, Yoshihide; and Satomura, Masato, 3,746,542.
Hiratsuka, Nobuo; Oshihozawa, Akiyasu; and Iwamoto, Tokuji, 3,746,566.
Hiratsuka, Nobuo; and Horiguchi, Masaru, 3,746,668.
Iwano, Haruhiko; and Inaba, Yutaka, 3,746,543.
Kondo, Asaji; Kitajima, Masao; and Miyano, Shizuo, 3,746,621.
Ohmatsu, Hideki; and Ueda, Hirozo, 3,746,539.
Tsuji, Nobuo; Miyazako, Takushi; Ueda, Hirozo; and Ono, Yoshiako, 3,746,547.
Fujieda, Toshio: *See—*
Nishikata, Ryoji; and Fujieda, Toshio, 3,746,629.
Fujimori, Katsuzo: *See—*
Sawada, Akihisa; and Fujimori, Katsuzo, 3,745,837.
Fujimoto, Hiroaki: *See—*
Morimoto, Ikohisa; Fujimoto, Hiroaki; Yamada, Kiyoshi; and Hisano, Kowashi, 3,747,035.
Fujio, Masaaki. Heat-shrinkable capsule. 3,746,201, Cl. 215-38.00a.
Fujitsu Limited: *See—*
Kobayashi, Kengo, 3,746,955.
Kobayashi, Kengo; and Manabe, Mitsuo, 3,746,959.
Fujiwara, Shohei: *See—*
Kano, Gota; Iizuka, Mutsuo; Fujiwara, Shohei; Hasegawa, Hiromasa; and Sawaki, Tsukasa, 3,746,950.
Fujiwara, Yasutake: *See—*
Misawa, Matsushi; Kato, Isao; and Fujiwara, Yasutake, 3,746,438.
Fukuda, Seizi, to Mitsubishi Jukogyo Kabushiki Kaisha. Stage seals for a turbine. 3,746,462, Cl. 415-115.000.
Fukushima, Tsutomu: *See—*
Miyashita, Tsuneo; and Fukushima, Tsutomu, 3,746,503.
Funk, Forrest E., to General Electric Company. Pressure containment penetration nozzle. 3,746,375, Cl. 285-286.000.
Funke, Klaus Ernst, to Digital Telephone Systems, Inc. Telephone signaling unit filter circuit. 3,747,009, Cl. 330-146.000.
Furman, Myron: *See—*
Pritchard, Harry W.; and Furman, Myron, 3,745,732.
Furuta, Keiichi: *See—*
Saito, Mashiro; Tanizaki, Yoshiharu; Furuta, Keiichi; and Minagawa, Kenichiro, 3,746,645.
FWI, Inc.: *See—*
Elliott, Robert E., 3,746,027.
Gaalen, Neil Van. Fish egg sorting apparatus for separating small eggs from larger eggs. 3,746,166, Cl. 209-74.000.
Gaber, Martin. Hammer operated switch construction. 3,746,809, Cl. 200-67.00g.
Gabor, Dennis, to Columbia Broadcasting System, Inc. Sonoradiography system. 3,745,814, Cl. 73-67.50h.
Gach, Peter P., to Sunbeam Plastics Corporation. Tablet dispenser. 3,746,154, Cl. 206-42.000.
Gaenzler, Carl W. Portable apparatus for testing fuel injection engines. 3,745,818, Cl. 73-119.00a.
GAF Corporation: *See—*
Psyras, Hippocrates G.; and Bellisio, Arthur Angelo, 3,745,746.
Psyras, Hippocrates G.; and Bellisio, Arthur Angelo, 3,745,747.
Gail, Josef. Foldable chair. 3,745,937, Cl. 108-128.000.
Galaktionov, Vasily Andreevich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.
Gale, W. D., Inc.: *See—*
Lenhart, Robert L., 3,746,207.
Gallaer, Charles A., to Envirotech Corporation, mesne. Fluid inlet structure for cyclone collectors. 3,745,752, Cl. 55-418.000.
Galle, Edward M., to Hughes Tool Company. Piston type shock absorbing and static load supporting drill string apparatus. 3,746,329, Cl. 267-125.000.
Gamertsfelder, George R., to Singer Company, The, mesne. Correlator. 3,747,094, Cl. 343-5.0mm.
Gamertsfelder, George R.; Goldfischer, Lester I.; McKendry, John K.; and Vesper, Richard M., to Singer Company, The, mesne. Cross-correlator with automatic rotational alignment. 3,747,103, Cl. 343-100.0cl.
Gammill, Lawrence A., to Hewlett-Packard Company. Phase-linking rotating mechansim fsr plural switch assembly. 3,746,804, Cl. 200-14.000.
Ganss, Alfred G.: *See—*
Freeberg, Charles A.; and Ganss, Alfred G., 3,746,325.
Ganss, Shirley: *See—*
Freeberg, Charles A.; and Ganss, Alfred G., 3,746,325.
Gant, Preston L.; Motes, Bill G.; and Brundage, Robert S., to Continental Oil Company. Method and apparatus for monitoring simultaneously two energy levels of radioactivity in a gas. 3,746,861, Cl. 250-380.000.
Ganz, Robert H. Method and apparatus for automatically cornerbreaking the side flange edges of paperboard blanks. 3,745,892, Cl. 93-49.00m.
Garcia, Donald J., to Schlumberger Technology Corporation. Electronic noise filter with means for compensating for hose reflection. 3,747,059, Cl. 340-18.0ld.
Garlock, Inc.: *See—*
Messenger, Edward J., 3,746,488.
Gartner, Stanley J.; and Gearhart, Charles L., to GTE Sylvania Incorporated. Handling aid utilizing vacuum operated counterbalance. 3,746,185, Cl. 214-1.0bh.
Gauger, Friedhelm, to Maschinenfabrik Ettlingen, Freidrich Pfeiffer KG. Apparatus for making concrete tubes. 3,746,494, Cl. 425-262.000.
Gauthier, Roland A., to Ladish Co. Creep annealing and a multiple pin fixture for use therein. 3,745,805, Cl. 72-364.000.
Gauthier, William D.; and Ridley, Jeter L., to Champion Spark Plug Company. Environment contamination control device. 3,745,991, Cl. 128-2.00r.
Gautney & Jones: *See—*
Gautney, George E., 3,746,991.
Gautney, George E., to Gautney & Jones. Remote control communications system. 3,746,991, Cl. 325-55.000.
Gayla Industries, Inc.: *See—*
Christoffel, Julius M., 3,746,286.
Gearhart, Charles L.: *See—*
Gartner, Stanley J.; and Gearhart, Charles L., 3,746,185.
Gebhardt, Hartmut, to Siemens Aktiengesellschaft. Telecommunication exchange switching network for four wire switching. 3,746,796, Cl. 179-18.0af.
Gebruder Junghans G.m.b.H., Firma: *See—*
Fichter, Walter; Armbruster, Otto; and King, Josef, 3,746,335.
Gehrke, Gerard W.: *See—*
Marcla, Americo E.; and Gehrke, Gerard W., 3,746,136.
Geitner, Karl R., to United States of America. Variable compensation for feedback control systems. 3,747,007, Cl. 330-51.000.
Gelfand, Peter C., to Envirotech Corporation, mesne. Circuits for controlling the power supplied to an electrical precipitator. 3,745,749, Cl. 55-105.000.
Gelin, Robert J., to Owens-Corning Fiberglas Corporation. Apparatus for advancing strand. 3,746,230, Cl. 226-168.000.
Gem Products, Inc.: *See—*
Johnsen, Eric C., 3,746,289.
Gemmer-France: *See—*
Bayle, Robert Vincent, 3,745,850.
General Electric Company: *See—*
Anatalio, Perfecto T., 3,746,292.
Berger, Abe; and Selin, Terry G., 3,746,734.
Buchanan, Edward R.; and Tarshis, Lemuel A., 3,746,586.
Cardwell, John G., Jr., 3,746,906.
Corman, James C.; and Walmet, Gunnar E., 3,746,081.
Cressman, Robert C.; and Sheldon, Luther M., 3,747,049.
Demarest, Donald M., 3,746,870.
Dochterman, Richard W.; and Yeaman, David H., Jr., 3,746,894.
Earing, Mason H., 3,747,037.
Elsworth, Robert M., 3,746,273.
Engeler, William E., 3,746,908.
French, Raymond J.; Wagner, Richard A.; and Zehr, Richard E., 3,746,917.
Funk, Forrest E., 3,746,375.
Hall, James A.; and Peppiatt, Harry J., 3,747,032.
Kotheimer, William C., 3,746,929.
Prucha, Richard V., 3,746,824.
Sasnett, Russell M.; and Stiner, James E., 3,746,416.
Sasnett, Russell M., 3,746,417.
Seager, Richard H., 3,745,966.
Sheldon, Luther M., 3,747,052.
Wentorf, Robert H., Jr.; and Rocco, William A., 3,745,623.
General Electric Company, Limited, The: *See—*
Harcourt, Michael David, 3,746,821.
General Industries, Inc.: *See—*
Grenier, Wilfred J., 3,746,098.

General Mills, Inc.: *See—*
Bateson, Robert N.; and Harper, Judson M., 3,746,546.
General Motors Corporation: *See—*
Boretti, Napoleon P., 3,745,888.
Bright, James A., 3,745,779.
Hause, Gilbert K., 3,745,643.
Hay, Charles N., 3,746,412.
Johnson, Ralph S., 3,746,475.
King, Jack B., 3,745,984.
Mason, George W., 3,746,469.
General Signal Corporation: *See—*
Coia, Pasco A., 3,747,083.
Fitzwater, Edwin, 3,745,604.
Knox, Raymond E.; and Teague, Roger W., 3,746,266.
General Time Corporation: *See—*
Robinson, Ralph C., 3,745,852.
Geniges, Frank H., to United States of America, Navy. Method and apparatus for encoding and decoding analog signals. 3,746,799, Cl. 178-22.000.
Gensman, Lee R.; and Nunn, Jack R., to Bio-Pure, Inc. Batch sewage treatment system and method. 3,746,638, Cl. 210-7.000.
Gentils, Marcel, to Essilor Internationah (Compagnie Generale d'Optique. Bow compasses. 3,745,662, Cl. 33-154.00f.
Gentry, Bobby C., to Southwire Company. Method of producing annealed stranded cable. 3,746,582, Cl. 148-13.000.
George, Terence Malcolm: *See—*
Brown, Christopher Robert; George, Terence Malcolm; and Norton, David John, 3,746,942.
German, Lorrayne T. Cycle saddle. 3,746,392, Cl. 297-380.000.
Gerritsen, Hendrick; and Greenaway, David L., to RCA Corporation. Shutterless playback device for holographic motion picture record pressings. 3,746,783, Cl. 178-6.800.
Gerth, Albert E.: *See—*
Sperti, George S.; and Gerth, Albert E., 3,745,896.
Gessaroli, Joseph; and Brody, Stanley S., to United States of America, Navy, mesne. Three-phase power control and phase shifter therefor. 3,746,969, Cl. 323-22.0sc.
Gevaert-Agfa N.V.: *See—*
Reeters, Emiel Adriaan; and Pauwels, Willy Lodewijk, 3,746,599.
Gianopulos, William, to International Business Machines Corporation. Cathode ray deflection system using field effect transistors. 3,746,913, Cl. 315-27.0td.
Gibson, Earl D., to North American Rockwell Corporation. System for correcting detected errors in a high speed digital data transmission system. 3,747,065, Cl. 340-146.10r.
Giddings, Edward H. Gasification method and apparatus. 3,746,521, Cl. 48-111.000.
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Gilleran, Gerald T.: *See—*
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Giovanclli, Alfred: *See—*
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Girten, William. Toilet flushing mechanism. 3,745,591, Cl. 4-1.000.
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Glanzstoff AG: *See—*
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Gledhill Road Machinery Company: *See—*
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Gledhill, Walter O. Splint assembly. 3,745,997, Cl. 128-88.000.
Gledhill, William; and Sherman, Phillip Leland, to Gledhill Road Machinery Company. Vehicular carried plow coupling. 3,746,368, Cl. 280-481.000.
Globe Oil Tools Company: *See—*
Welton, Russell L., 3,746,405.
Glos, Franz; and Mischke, Joachim, to Uhde, Friedrich, G.m.b.H. Apparatus for the electrolysis of alkali metal chloride solutions with mercury cathode. 3,746,631, Cl. 204-219.000.
Goan, John C.; and Joo, Louis A., to Great Lakes Carbon Corporation. Oxidized carbon fibers. 3,746,560, Cl. 106-307.000.
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Runtzel, Royal K.; and Goede, Walter F., 3,746,909.
Goettl, Adam D. Centrifugal blower assembly. 3,746,464, Cl. 415-201.000.
Gold, Harold. Fluid tight conduit fastening system. 3,746,376, Cl. 285-334.200.
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McCullough, Lester E.; and Ladine, Duane A., 3,746,106.
Goldberg, Arnold J.: *See—*
Knavish, Leonard A.; Goldberg, Arnold J.; and Hilliard, William G., 3,746,527.
Goldberg, Morton E., to Mallinckrodt Chemical Works. Methods for inhibiting aggressive behavior by means of s-triazolo-[3,4-a]-isoquinolines. 3,746,714, Cl. 424-258.000.
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Goldfischer, Lester I.: *See—*
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Golzio, Pier Giorgio: *See—*
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Gonzalez, Francisco V. Drafting instrument for drawing parallel lines. 3,745,657, Cl. 33-110.000.
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Goodman, Abraham. Elastic snood. 3,746,016, Cl. 132-46.00r.
Goodrich, B. F., Company, The: *See—*
Bartley, Donald R.; and Sidles, James, 3,746,590.
Goodrich, George W., to Bendix Corporation. Deflectable membrane optical modulator. 3,746,785, Cl. 178-7.50d.
Goodwich, B. F., Company, The: *See—*
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Ofstead, Eilert A., 3,746,695.
Watts, William A., 3,746,682.
Goosey, Richard Ernest, to Imperial Metal Industries. Titanium-base alloys. 3,746,585, Cl. 148-32.500.
Gordon, Maxwell; and Weisbach, Jerry A., to Smith Kline & French Laboratories, Inc. Phosphatide derivatives of prostaglandins. 3,746,728, Cl. 260-403.000.
Gordy, Travis L., to Continental Oil Company. Strippable coating compositions. 3,746,561, Cl. 117-6.000.
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Goser, Karl, to Siemens Aktiengesellschaft. Semiconductor memory. 3,747,077, Cl. 340-173.00r.
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Thompson, Henry Bryan; and Mautz, Jerry Lee, 3,746,160.
Grandy, Andrew J., to United States of America, Army. Training cartridge. 3,745,923, Cl. 102-41.000.
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Gray, John; and Anderson, Gene W., to Liqui-Trol Systems, Inc. Water pressure booster system using auxilliary pump to super charge pressurized reservoir. 3,746,471, Cl. 417-7.000.
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Grenier, Wilfred J., to General Industries, Inc. Automatic on-off sprinkler head system. 3,746,098, Cl. 169-37.000.
Grey, Jerry. Heat exchanger apparatus and method. 3,746,082, Cl. 165-61.000.
Griess, Herbert C.: *See*—
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Griffin, Phil H., III; and Sharki, Martin J., to Dresser Industries, Inc. Automatic drilling break alarm and shutdown system. 3,746,102, Cl. 173-4.000.
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Grifoni, Raffaello. Dummy head for supporting wigs during drying. 3,746,221, Cl. 223-66.000.
Gronberg, Sven Jorgen Gerhard. Agricultural machine. 3,745,754, Cl. 56-14.400.
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Grove, Marvin H.; and Kim, Kee W., to M & J Valve Company and M & J Development Company. Valve construction and method. 3,746,303, Cl. 251-159.000.
Grundig: *See*—
Raebiger, Wolfgang, 3,745,765.
Gruner, Heinz Walter, to Sybron Corporation. Electromagnetic flow transducers having laminar electrodes. 3,746,896, Cl. 310-11.000.
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Cavalieri, Bruno; and Lancini, Giancarlo, 3,746,705.
Gsrbaty, Martin L., to Esso Research & Engineering Company. S-(1-Methyl-2-azo-4-thiopyrimidinyl-methyl)-O, O-dimethylphosphorothioate. 3,746,713, Cl. 260-251.00p.
GTE Automatic Electric Laboratories Incorporated: *See*—
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Lender, Adam, 3,746,787.
Thomas, Robert M., 3,746,798.
GTE Sylvania Incorporated: *See*—
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Mathers, James E.; Mikus, Felix F.; and Yale, Ramon L., 3,746,652.
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Guay, Viateur: *See*—
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Guerre, Robert P.; and Ruland, Ross R., to Esso Research and Engineering Company. Staged air burner with swirling auxiliary air flow. 3,746,499, Cl. 431-182.000.
Guidi, William R., to Digital Technology Corporation. Portable magnetic tape recorder having means for eliminating switch bounce. 3,747,118, Cl. 346-74.00m.
Guilleray, Roger, to Hure S.A. Locking devices. 3,745,619, Cl. 29-1.00a.
Guistan, Bulent, to Deutsch Fastener Corporation. Shear-resistant captive screw. 3,746,067, Cl. 151-69.000.
Gulbenk, Aylin H.; Horne, Dorothy J.; and Johnston, Howard, to Dow Chemical Company, The. Tricyclic pyrazino compounds and method for preparing the same. 3,746,707, Cl. 260-243.0an.
Gulf Oil Corporation: *See*—
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Chun, Sun W.; Hamilton, Harry A.; and Montagna, Angelo A., 3,746,637.
Paraskos, John A.; and Somers, Allen E., 3,746,636.
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Gulick, Joseph A., to United States of America, Navy. Apparatus for identifying main lobe responses. 3,747,100, Cl. 343-100.0le.
Gulistan, Bulent, to Deutsch Fastener Corporation. Fastener for producing relative movement of parts. 3,745,708, Cl. 49-454.000.
Gulton Industries, Inc.: *See*—
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Sheldon, James B., 3,747,042.
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Gunn, Lawrence G.: *See*—
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Gupta, Kashmiri L., to Du Pont de Nemours, E. I., and Company, mesne. System and process for controlling polymerization of condensation polymers. 3,746,693, Cl. 260-78.00r.
Guralnick, Sidney A., to Traveling Nut Corporation. Motion transmitting device. 3,745,840, Cl. 74-89.150.
Guyton, William V., to Sol-Tek Industries, Inc. Power supply system for heavy traction loads. 3,746,964, Cl. 321-5.000.
Haag, Robert; Haupt, Albert; and Mayer, Siegfried, to Bosch, Robert, G.m.b.H. Cast reinforced housing and method of making the same. 3,745,854, Cl. 74-606.00r.
Haberlin, Hans Paul, to Wheelabrator Corporation, The, mesne. Centrifugal blasting wheel and blade latching means. 3,745,711, Cl. 51-9.000.
Hackbarth, Lowell E.; and Crockett, Joseph T., to Huber, J. M., Corporation. Alkali metal alumino silicated, methods for their production and compositions thereof. 3,746,559, Cl. 106-288.00b.
Haga, Tsunehiro: *See*—
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Hahn, Le Roy W. Soil drier. 3,745,700, Cl. 47-1.420.
Hahn, Robert S.; Lindsay, Richard P.; Robillard, Edward G.; and Youden, David H., to Heald Machine Company, The. Grinding machine. 3,745,710, Cl. 51-5.000.
Haibach, Heinz Eugen, to Dravo Corporation. Process and apparatus for the control of the speed of movement of sinter strand. 3,746,537, Cl. 263-28.000.
Hajsman, Vaclav, to Skoda narodni podnik. Feeding device for machine tools. 3,745,712, Cl. 51-33.00w.
Hakstian, Robert W. Support for hand, wrist and forearm surgery. 3,746,332, Cl. 269-328.000.
Hale, Elden A., Sr.: *See*—
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Halibrand, Henry T. Side thrust limiter for ring and pinion gearing. 3,745,848, Cl. 74-410.000.
Hall, Gary E. Focus nozzle directional bit. 3,746,108, Cl. 175-61.000.
Hall, James A.; and Peppiatt, Harry J., to General Electric Company. Arrangement for providing improved linearization of the voltage-frequency characteristic of a resonant circuit having a voltage-variable capacity diode. 3,747,032, Cl. 333-82.00b.
Hall, James D.: *See*—
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Hall, James M.; and Clipp, Louis L., to Exotech Incorporated. Apparatus for producing a pulse of liquid for machining operations. 3,746,256, Cl. 239-101.000.
Hall, Larry E.; Branen, Leonard A.; and Moore, Glen F., to Charles Machine Works, Inc., The. Mounting for vibrating tool having damping means for isolating vibrations. 3,746,100, Cl. 172-40.000.
Haller, Jordan D. Atraumatic surgical clamp. 3,746,002, Cl. 128-322.000.
Hamel, Roger Bernard Jules: *See*—
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Hamilton, Gordon W.: *See*—
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Hammann, Ingeborg; Hoffmann, Peter; Kleimann, Helmut; Marouarding, Dieter; Offermann, Klaus; Ugi, Ivar; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. Acaricidal isocyano-diphenylethers and thioethers. 3,746,766, Cl. 424-304.000.
Hammes, Josef, to Lowell Manufacturing Company. Protective speaker back-can. 3,746,125, Cl. 181-31.00b.
Hancock, Charles L., to Westinghouse Electric Corporation. Latch arrangement for appliance. 3,746,382, Cl. 292-241.000.
Hand, Hi: *See*—
Hand, Hi; and Serritella, Angela C. (said Serritella assor. to), 3,746,007.
Hand, Hi; and Serritella, Angela C., said Serritella assor. to Hand, Hi. Sleeping garment. 3,746,007, Cl. 128-455.000.
Haniu, Kiyoshi: *See*—
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Hansen, William A., to Moore, Paul, Company Limited, The. Washing apparatus. 3,746,019, Cl. 134-56.00d.
Hanset, Eugene; and Hanset, Richard E. Measuring system. 3,746,217, Cl. 222-194.000.
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Hara, Akio; and Yazu, Syuji, to Sumitomo Electric Industries Ltd. High strength metal bonded tungsten carbide base composites. 3,746,519, Cl. 29-182.700.
Harbaugh, John A. Tool for turning fabric tubes. 3,746,220, Cl. 223-42.000.
Harcourt, Michael David, to General Electric Company, Limited, The. Crossbar switch with ramp means facilitating conductor assembly subsequent to housing assembly. 3,746,821, Cl. 200-175.000.
Hargrave, Richard D.: *See*—
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Harman, Maurice, to W. Notting Limited. Dies for cutting shapes. 3,745,857, Cl. 76-107.00c.
Harmon, Carlyle; and Sibbach, William, to Johnson & Johnson. Sheet material. 3,746,607, Cl. 161-109.000.
Harper, Judson M.: *See*—
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Harper, Robert C., to Cincinnati Milacron Inc. Fluid metering system. 3,746,048, Cl. 137-628.000.
Harper, Robert C.; Creeden, G. W.; and Sourup, Victor G., to Cincinnati Milacron Inc. Multi-stage mixing device. 3,746,311, Cl. 259-7.000.
Harris, John Derek, to Lucas, Joseph, (Industries) Limited. Improvements in and relating to manufacture of electric storage batteries. 3,745,635, Cl. 29-204.000.
Harris-Intertype Corporation: *See*—
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Harrison, Lee, III; Honey, Francis J.; Tauchman, Edwin J.; and Parker, Marshall M., to Computer Image Corporation. Digitally controlled computer animation generating system. 3,747,087, Cl. 340-324.0ad.

Hart, Alexander W.; and Acton, Daniel D., to Anchor Hocking Corporation. Closure cap and sealed package. 3,746,199, Cl. 215-40.000.

Hartmann, Uwe, to Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH. TV circuit for production of parabolic line-frequency voltage. 3,746,922, Cl. 315-276.00d.

Hartung, Winfried, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Liquid level gauge. 3,747,084, Cl. 340-244.00r.

Hartwig, Walter J., to Allis-Chalmers Corporation. Grate conveyor. 3,745,670, Cl. 34-217.000.

Hasegawa, Hiromasa: *See*—
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Haskell, Robert A.: *See*—
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Haskin, Charles A.; and Millhone, Ralph S., to Chevron Research Company. Apparatus for use in wells. 3,746,088, Cl. 166-59.000.

Haskins, David R. Snowmobile ambulances. 3,746,357, Cl. 280-15.000.

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Hathaway, Bruce E.; Huffman, Earl W.; and O'Connor, Keyney J., to R. F. Inc, mesne. Compactible protective shield. 3,745,938, Cl. 109-49.500.

Haubner, Georg; and Hofer, Walter, to Bosch, Robert, G.m.b.H. Magneto generator for ignition systems of internal combustion engines. 3,746,901, Cl. 310-70.000.

Haupt, Albert: *See*—
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Hauth, Jean-Marc Laurent, to Pont-A-Mousson S.A. Device for taking up wear for a disc brake and a brake including said device. 3,746,133, Cl. 188-196.0ba.

Hawker Siddeley Aviation Limited: *See*—
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Hawrylo, Frank Zygmunt: *See*—
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Hay, Charles N., to General Motors Corporation. Self-adjusting nut assembly for wheel retainment. 3,746,412, Cl. 308-207.00a.

Hayakawa, Yoshihide; and Satomura, Masato, to Fuji Photo Film Co., Ltd. Process for the production of polymer images. 3,746,542, Cl. 96-48.00r.

Haynes, Benjamin O., to Mylec Digital Sciences, Inc. Electronic data processing system. 3,747,071, Cl. 340-172.500.

Hazelett, Robert M., Jr.: *See*—
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Heald Machine Company, The: *See*—
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Hecht, Rudolph A., to TRW Inc. Adaptor. 3,747,050, Cl. 339-156.00r.

Heiland, Manfred, to Schenck, Carl, Maschinenfabrik GmbH, Firma. Substantially rigid bearing for rotary bodies. 3,746,409, Cl. 308-15.000.

Heilmann, Max, to Agfa-Gevaert Aktiengesellschaft. Photographic color developer. 3,746,544, Cl. 96-66.400.

Heim, David E., to Magnavox Company, The. Adaptive equalizer for digital information. 3,746,989, Cl. 325-42.000.

Heimbigner, Gary L., to North American Rockwell Corporation. Input synchronizer circuit. 3,746,882, Cl. 307-205.000.

Heinemann, Otto; Schefer, Manfred; Schossler, Werner; and Philipp, Rainer, to Polysius AG. Cooling apparatus and method. 3,745,667, Cl. 34-20.000.

Heinig, Richard H.; and Bowen, Omer, to Bear Brand Hosiery Co. Apparatus for feeding elastic yarn to circular knitting machines. 3,745,793, Cl. 66-146.000.

Helguera, Andres R. Thermic pot. 3,746,205, Cl. 220-13.000.

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Helm, Herbert W.; and O'Keefe, John Gail, to Smithe, J. L., Machine Company, Inc. Apparatus for applying patches to envelope blanks. 3,745,893, Cl. 93-61.00a.

Helm, Herbert W., to Smithe, F. L., Machine Company, Inc. Flap folding apparatus. 3,745,894, Cl. 93-61.000.

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Hendrickson, Arthur M.; and Crealock, William I. B. Sliding hatch cover for sailboats. 3,745,957, Cl. 114-202.000.

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Henrich, Donald A., to Outboard Marine Corporation. Racing lower unit. 3,745,964, Cl. 115-34.00r.

Hensel, Werner: *See*—
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Hepp, Harold E.; and White, James E., to National Cash Register Company, The. Line printer paper tensioning mechanism. 3,746,142, Cl. 197-133.00r.

Heptig, Albert S.: *See*—
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Hermstein, Wolfgang, to Siemens Aktiengesellschaft. Weather-resistant light transmitting isolating device. 3,746,424, Cl. 350-96.00b.

Herpich, William A.; Chaney, Donal W.; and Palmer, George W., to Peabody Galion Corporation. Tailgate for a rear loader refuse vehicle. 3,746,192, Cl. 214-83.300.

Herr, Theodore Z. Sliding door construction utilizing an inflatable seal. 3,745,707, Cl. 49-449.000.

Herring, Joseph S. Pipeline plugging pig. 3,746,026, Cl. 137-1.000.

Hershberg, Philip I. Interviewing machines and method. 3,747,069, Cl. 340-172.500.

Hester, Sam R., Jr. Temperature and voltage controlled circuit. 3,745,925, Cl. 102-70.20r.

Hetzel, Max, to Omega Louis Brandt et Freres, S.A. Motion transformer. 3,745,843, Cl. 74-128.000.

Hetzel, Robert J., to Avtron Manufacturing, Inc. Rotor and stator mounting for dynamic machines. 3,746,902, Cl. 310-67.000.

Hewett, Anthony Reginald George, to Bell's Asbestos and Engineering Pty., Limited. Slip-joint construction. 3,746,603, Cl. 161-40.000.

Hewlett-Packard Company: *See*—
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Hibbert, Sydney George, to Sprocket Properties Limited. Fluidised bed apparatus and method. 3,745,940, Cl. 110-8.00r.

Hickey, Lionel Russell, to Eastman Kodak Company. Magnetically-controlled machine programmer. 3,746,443, Cl. 355-14.000.

Hickner, George B.; and Hendrickson, Richard T., to Bendix Corporation, The. Regulator for adaptive braking system. 3,746,402, Cl. 303-21.00f.

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Hidassy, Laszlo: *See*—
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Higashi, Fukuji: *See*—
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Hilditch, David Henry, to Associated Electrical Industries, Limited. Electron microscopes. 3,746,855, Cl. 250-49.50a.

Hilger, Edwin T.; and Miller, James S., to Logan Co. Shuttle car mechanism for transferring loads between two stations. 3,746,148, Cl. 198-219.000.

Hill, Franklin J., to Parker Pen Company, mesne, The. Ball point pen writing ball composed of a cemented carbide composition. 3,746,456, Cl. 401-215.000.

Hill, Harold Taylor; and Fletcher-Jones, David Francis, to Wellworthy Limited. Pistons for internal combustion engines, or for compressors. 3,745,889, Cl. 92-187.000.

Hill, Homer E., 1/2 to Morgan, Marvin R. Method and apparatus for rebuilding television picture tubes. 3,746,419, Cl. 316-2.000.

Hill, Michael Arthur Charles. Device for use in transposing musical keys or notes. 3,745,872, Cl. 84-473.000.

Hill, William P., to National Steel Corporation. Method for improving continuously cast strands. 3,746,070, Cl. 164-57.000.

Hillestad, Jerry G.: *See*—
Pierce, Aaron E.; Burns, William A., Jr.; Cooke, Claude E., Jr.; Hillestad, Jerry G.; and Spillette, Arthur G., 3,745,822.

Hilliard, William G.: *See*—
Knavish, Leonard A.; Goldberg, Arnold J.; and Hilliard, William G., 3,746,527.

Hilssen, Ole K.: *See*—
Freimark, Ronald J.; and Hilssen, Ole K., 3,747,005.

Hilton, John L.; and Hamilton, Gordon W., to United States of America, Atomic Energy Commission. High intensity neutron source. 3,746,859, Cl. 250-84.500.

Hindel, Hans; and Fries, Hugo, to Pumpenfabrik Urach. Reciprocating piston pump. 3,746,483, Cl. 417-571.000.

Hintzen, Walter J.: *See*—
Hynes, Joseph H.; Hintzen, Walter J.; and Jansen, Martin B., 3,746,372.

Hirasawa, Kotaro; Kawatake, Koichi; and Iwasaka, Tatsuo, to Hitachi, Ltd. System for controlling a plurality of elevator cars. 3,746,131, Cl. 187-29.00r.

Hiratsuka, Nobuo; Oshihozawa, Akiyasu; and Iwamoto, Tokuji, to Fuji Photo Film Co., Ltd. Mat film for writing. 3,746,566, Cl. 117-72.000.

Hiratsuka, Nobuo; and Horiguchi, Masaru, to Fuji Photo Film Co., Ltd. Process for preparing a porous nylon film. 3,746,668, Cl. 260-2.50m.

Hire, Charles John, to Fasco Industries, Inc. Thermostat and method of making same. 3,747,039, Cl. 337-380.000.

Hisano, Kowashi: *See*—
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Hitachi, Ltd.: *See*—
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Hobbs, Oliver K. Shucker. 3,745,913, Cl. 99-625.000.

Hocksell, Heimo H.: *See—*
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Hodan, Joseph E., III. Astrological teaching and amusement device. 3,746,344, Cl. 273-143.00d.

Hodgson, Duncan Barry: *See—*
Williams, Malcolm; and Hodgson, Duncan Barry, 3,745,817.

Hoegger, Erhard Fritz, to Du Pont de Nemours, E. I., and Company. Composite boards prepared from foam sheeting. 3,746,610, Cl. 161-168.000.

Hoerman, Kirk C.; Shklair, Irving L.; Klima, James E.; and Simonson, Lloyd G., to United States of America, Navy. 48 Hour test for streptococcus mutans in plaque. 3,746,624, Cl. 195-100.000.

Hofacker, Erick; and Hofacker, Frauke, nee Schluter, to Etablissement Rivolan. Process for adjusting the fit of and repairing dentures. 3,745,651, Cl. 32-2.000.

Hofacker, Frauke, nee Schluter: *See—*
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Hofer, Walter: *See—*
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Hoffmann, Dieter: *See—*
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Hoffmann, Peter: *See—*
Hammann, Ingeborg; Hoffmann, Peter; Kleimann, Helmut; Marouarding, Dieter; Offermann, Klaus; Ugi, Ivar; and Unterstenhofer, Gunter, 3,746,766.

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Hoft, Donald J.; and Wallace, John B., to Raytheon Company. Voltage controlled crystal oscillator. 3,747,023, Cl. 332-26.000.

Hogan, Warren R.; and Larsen, Reidar G., to Texas Instruments, Incorporated. Panel board systems and components therefor. 3,746,932, Cl. 317-101.0dh.

Hogg, Walter R., to Coulter Electronics, Inc. Self-cleaning aperture tube for coulter study apparatus. 3,746,976, Cl. 324-71.0cp.

Hogg, Walter R., to Coulter Electronics, Inc. Aperture tube assembly for a particle study apparatus. 3,746,977, Cl. 324-71.0cp.

Hohman, William H., to Franklin Electric Co., Inc. Switching circuit for motor start winding. 3,746,951, Cl. 318-221.00e.

Hohne, Gerd, to Bosch, Robert, G.m.b.H. Arrangement for preventing current flow in the ignition coil or an internal combustion engine during standstill conditions. 3,745,985, Cl. 123-146.50d.

Hold, Peter: *See—*
Rizzi, Marc A.; Hold, Peter; D'Amato, Dominic A.; and Ramazzotti, Dario J., 3,746,489.

Holder, David A., Jr. Pressure board for the electrical contacts for an electric organ. 3,746,820, Cl. 200-170.00a.

Holland, Andrew M.: *See—*
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Holland Hitch Company: *See—*
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Holley Carburetor Company: *See—*
Ciemochowski, Michael F., 3,746,986.

Holley, Willard L. Block device for maintaining camber in skis. 3,746,355, Cl. 280-11.37c.

Holmboe, Christian Fredrik: *See—*
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Holmlund, Henrik: *See—*
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Honey, Francis J.: *See—*
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Freeborn, John C., 3,747,006.
Mason, Kenneth A., 3,746,432.
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Hoplab Inc.: *See—*
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Horibe, Koichi; Kaneko, Shoji; Sato, Tomoyuki; and Haniu, Kiyoshi, to Tanabe Kakoki Co., Ltd. Poking device for electric smelting furnace of closed-type. 3,746,771, Cl. 13-1.000.

Horiguchi, Masaru: *See—*
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Horin, Shoji: *See—*
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Horne, Dorothy J.: *See—*
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Horzepa, John P., to Engelhard Minerals & Chemicals Corporation. Fluid cracking catalyst and preparation thereof. 3,746,659, Cl. 252-448.000.

Hosaka, Yasuhide. Die set having automatic feed between successive stages. 3,745,808, Cl. 72-405.000.

Hotta, Tetsuya; Okuda, Kensuke; and Sugita, Minoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for manufacturing carpet having low static charge. 3,746,573, Cl. 117-139.50c.

Hotz, Karl, to Siemens Aktiengesellschaft. Filling apparatus for nuclear fuel pellets or the like. 3,746,190, Cl. 214-34.000.

Hotz, Karl, to Siemens Aktiengesellschaft. Closure apparatus. 3,746,208, Cl. 220-46.00r.

Hovanchak, John A.: *See—*
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Howard, Dean D., to United States of America, Navy. Radar target imaging technique. 3,747,097, Cl. 343-11.00r.

Howchin, Ronald M. Circuit breaker. 3,747,034, Cl. 335-38.000.

Howell, William E., to United States Steel Corporation. Temperature-sensing device for continuous-casting molds. 3,745,828, Cl. 73-295.000.

Howland, Benjamin T. Disposable baby bottle. 3,746,198, Cl. 215-11.00r.

Hoyler, Robert C.; Slattery, Brian R.; and Thorne-Booth, George M., to Westinghouse Electric Corporation. Signal receiving apparatus for a vehicle control system. 3,746,857, Cl. 246-36.000.

H.P.I. Interstate, Ltd., mesne: *See—*
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Hsu, Charles Jui-Cheng. Water-in-oil detector. 3,745,659, Cl. 33-126.70r.

Hubby, Laurence M., to Texaco, Inc. Anchoring method for offshore marine structures. 3,745,776, Cl. 61-53.600.

Hubele, Adolf, to Ciba Limited. Phenoxyacetic acid derivatives. 3,746,741, Cl. 260-471.00r.

Huber, J. M., Corporation: *See—*
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Hudson, James Elmore, Jr., to Simplec Mfg., Co. Bistable circuit controlled sequential damp indicator. 3,747,063, Cl. 340-109.00r.

Huff, Warren C.: *See—*
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Huffhines, Donald F., to Mobile Oil Corporation. Method of and system for reducing secondary pressure pulses in operation of pneumatic sound source in water. 3,746,123, Cl. 181-.5me.

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Huffman, Ralph Richard; and Smith, Siegfred Alexander, to Motorola, Inc. Offset top ejection vapor deposition apparatus. 3,745,969, Cl. 118-48.000.

Hughes Aircraft Company: *See—*
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Hughes Tool Company: *See—*
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Hughey, Howard G., to Airco, Inc. Cutting torch tip. 3,746,500, Cl. 431-346.000.

Hunt, Mack W.; and Rogers, Lynn C., to Continental Oil Company. Preparation of highly basic, sulfurized alkylphenols. 3,746,698, Cl. 260-137.000.

Hunt, Paul R.: *See—*
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Hunter, Cecil M. Air speed indicator. 3,745,823, Cl. 73-182.000.

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Hynes, Joseph H.; Hintzen, Walter J.; and Jansen, Martin B., to Vetco Offshore Industries, Inc. Flexible pipe joints. 3,746,372, Cl. 285-95.000.

I'Anson, Thomas C., to Motorola, Inc. Protective carrier for semiconductor devices. 3,746,157, Cl. 206-46.0ed.

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Ichinose, Richard Y.: *See—*
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Ifield, Richard Joseph, to Lucas, Joseph, (Industries) Limited. Jounal bearings. 3,746,406, Cl. 308-36.300.
Iida, Yozo, to Nippon Kogaku K.K. Film rewinding device for a miniature motion. 3,746,434, Cl. 352-91.000.
Iida, Yozo, to Nippon Kogaku K.K. Cinecamera automatic fading device. 3,746,435, Cl. 352-91.000.
IIT Research Institute: *See—*
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Imperial Chemical Industries, Limited: *See—*
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Iwao, Kumiy Roy; and Yee, David, to Continental Oil Company, mesne. Nuclear reactor fuel element spacer assembly. 3,746,617, Cl. 176-78.000.
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Jankelson, Bernard. Disposable electrodes for electrical stimulation of muscles and nerves of the head. 3,746,004, Cl. 128-410.000.
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Jasper, Louis J., Jr.; de Santis, Charles M.; and Sherburne, Frederick B., to United States of America, Army. Traveling wave tube with planar equiangular spiral slow wave circuit. 3,746,915, Cl. 315-39.300.
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Jimenez, David J. Educational puzzle. 3,745,675, Cl. 35-73.000.
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Johnson, Erlon Fitch; and Kopenhaver, Kenneth Oscar, to AMP Incorporated. High voltage connector. 3,747,048, Cl. 339-75.00r.
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Johnson, Ralph S., to General Motors Corporation. Double-acting swashplate compressor. 3,746,475, Cl. 417-269.000.

Johnson, Ray Clifford, to Harris-Intertype Corporation. Cyclic variable speed drive. 3,745,865, Cl. 83-313.000.

Johnson, Raymond D. Winch having a selectable stable 'at rest' unbraked drum position during each revolution. 3,746,309, Cl. 254-150.000.

Johnson, Robert P.: *See—*
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Jonason, Karl Gunnar; Karlsson, Karl Harry; and Remning, Ake Gustaf Vilhelm, to Granges Essem Aktiebolag. Method and apparatus for manufacturing finned heat exchangers. 3,745,631, Cl. 29-157.30a.

Jones, Roger D.; and Burnham, Peter B., to Abex Corporation. Hydraulic brakes. 3,746,403, Cl. 303-89.000.

Jones, William Earl, to Miles Laboratories, Inc. Holder for flat rectangular objects. 3,746,161, Cl. 206-72.000.

Joo, Louis A.: *See—*
Goan, John C.; and Joo, Louis A., 3,746,560.

Joy, John R., to Union Carbide Corporation. Silyl acyl peroxide and acyl peroxy polysiloxane binders. 3,746,611, Cl. 161-206.000.

Joyner, Frederick B.; and Cash, George O., Jr., to Eastman Kodak Company. Decoratable polyolefin plastics. 3,746,676, Cl. 260-27.000.

Judd, John F.: *See—*
Watkins, Phillip L.; Cox, Raymond W.; Carl, John M.; and Judd, John F., 3,747,046.

Juddy, William A., to Goodyear Tire & Rubber Company, The. Catalyst systems for polymerizing alicyclic olefins. 3,746,696, Cl. 260-93.100.

Jung, Jurgen, to Interatom Internationale Atomreaktorbau GmbH. Method of separating carbon from alkali and alkali earth metals. 3,746,510, Cl. 23-230.00r.

Junk, Thomas A.; and Bunk, Carl P., to Component Equipment Manufacturing, Inc. Self-feeding double-cut saw. 3,745,866, Cl. 83-423.000.

Justrite Manufacturing Company: *See—*
Flider, Frank S., 3,746,200.

Kabel- und Metallwerke Gutenhoffnungshutte Aktiengesellschaft: *See-*
Prinzhorn, Klaus, 3,747,029.

Kabushiki Kaisha: *See—*
Murata, Keiichi, 3,746,025.

Kabushiki Kaisha Daini Seikosha: *See—*
Kurosawa, Moriyoshi, 3,745,759.

Kabushiki Kaisha Kohka: *See—*
Misawa, Matsushi; Kato, Isao; and Fujiwara, Yasutake, 3,746,438.

Kabushiki Kaisha Ricoh: *See—*
Ando, Sadanao; and Miyagawa, Umihiro, 3,745,898.

Kabushiki Kaisha Suwa Seikosha: *See—*
Kuriia, Masahiro, 3,745,758.
Tsuruishi, Yuki, 3,745,761.

Kagan, Avihu: *See—*
Willinger, Allan H.; Dinnerstein, Albert J.; and Kagan, Avihu, 3,746,168.

Kahle, Rolf D.; Studey, David K.; and Bryson, James D., to Bessemer Securities Corporation. Microfiche recorder and processor. 3,746,444, Cl. 355-28.000.

Kahn, Lawrence F., to United States of America, Navy. Underwater in situ placement of concrete. 3,745,775, Cl. 61-46.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Langewis, Cornelis, 3,745,633.
Langewis, Cornelis; and Smith, Arthur Dean, 3,745,804.

Kakei, Jun; and Yamaguchi, Hiroisugo, to Nissan Motor Company, Limited. Defroster. 3,745,906, Cl. 78-2.090.

Kalamazoo Industries, Inc.: *See—*
Allen, Plateau, 3,746,353.

Kalle Aktiengesellschaft: *See—*
Moser, Hermann, 3,746,145.

Kallfelz, Albert J.; and Schmeling, Carl J., to Carrier Corporation. Multiple tube finning apparatus. 3,745,801, Cl. 72-78.000.

Kamei, Hisashi; Koezuka, Junji; and Imooka, Masanori, to Tokyo Shibaura Electric Co., Ltd. Apparatus and method for determining the alcoholic content of breath. 3,746,512, Cl. 23-232.00e.

Kamens, Ernest Rudolph: *See—*
Bafford, Richard Anthony; Kamens, Ernest Rudolph; and Mageli, Orville Leonard, 3,746,735.

Kamino, Tadashi: *See—*
Ohata, Shuichi; Kamino, Tadashi; Takeuchi, Yoji; and Ishiguro, Takeshi, 3,746,874.

Kan, Peter T.: *See—*
Patton, John T., Jr.; Cenker, Moses; and Kan, Peter T., 3,746,709.

Kane, Robert J. Adjustable hydrotherapy jet producing device. 3,745,994, Cl. 128-66.000.

Kaneko, Shoji: *See—*
Horibe, Koichi; Kaneko, Shoji; Sato, Tomoyuki; and Haniu, Kiyoshi, 3,746,771.

Kannenberg, Wesley G.; and Pruden, William E., to International Business Machines Corporation. Method for boride coating steel electrolytically. 3,746,628, Cl. 204-39.000.

Kano, Gota; Iizuka, Mutsuo; Fujiwara, Shohei; Hasegawa, Hiromasa; and Sawaki, Tsukasa, to Matsushita Electronics Corporation. Pressure-sensitive Schottky barrier semiconductor device having a substantially non-conductive barrier for preventing undesirable everse-leakage currents and method for making the same. 3,746,950, Cl. 317-235.00r.

Kao Soap Co., Ltd.: *See—*
Arai, Haruhiko; Horin, Shoji; and Maruta, Iwao, 3,746,677.

Kappeler, Otto; and Messner, Rudolf, to Ef Ka-Werke Fritz Kiehn GmbH. Manually operable cigarette making device. 3,746,011, Cl. 131-70.000.

Kar-Denser, Inc.: *See—*
Patros, George C., 3,745,916.

Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, to Merck & Co., Inc. α-Hydrazino-β-phenyl alkanoic acids and their derivatives. 3,746,753, Cl. 260-519.000.

Karandy, Fred: *See—*
Moyer, Ross; and Karandy, Fred, 3,745,644.

Karasz, Margaret K. Pet training tray. 3,745,974, Cl. 119-1.000.

Karatjas, Manuel, to Ultrasonic Systems, Inc. Ultrasonic multi-frequency system. 3,746,897, Cl. 310-8.100.

Kareby, Erik: *See—*
Fransson, Johnny; Holmlund, Henrik; and Kareby, Erik, 3,746,310.

Karlsmith, Lawrence A., to Improved Machinery Inc. Method of making annular grid structure. 3,745,642, Cl. 29-475.000.

Karlsson, Karl Harry: *See—*
Jonason, Karl Gunnar; Karlsson, Karl Harry; and Remning, Ake Gustaf Vilhelm, 3,745,631.

Karsch, Arthur F.: *See—*
Druschel, William O.; Karsch, Arthur F.; and Schneider, William C., Jr., 3,745,897.

Kartarik, Henry, to Ideal Security Hardware Corporation. Cross bolt beadlock. 3,746,380, Cl. 292-117.000.

Kasano, Hiroyuki: *See—*
Aoki, Masaharu; Kasano, Hiroyuki; Kurata, Kazuhiro; and Ogirima, Masahiko, 3,746,943.

Kastrinos, Arthur, to Marcona Corporation. Trunion liner and seal for rotary mills. 3,746,268, Cl. 241-179.000.

Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, to Paramount Glass Mfg. Co., Ltd. Cooling fins. 3,746,525, Cl. 65-12.000.

Kato, Isao: *See—*
Misawa, Matsushi; Kato, Isao; and Fujiwara, Yasutake, 3,746,438.

Kato, Ryuzo: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.

Kato, Tamotsu. Portable electric sewing machine. 3,745,950, Cl. 112-169.000.

Katz, Max: *See—*
Desperak, Sam; Roschko, Joseph; and Katz, Max, 3,745,948.

Kawaguchi, Shojiro: *See—*
Okamoto, Shinsuke; Unoue, Hiromitsu; Ohasi, Hirosi; Mori, Hirokazu; and Kawaguchi, Shojiro, 3,747,058.

Kawai, Kiyohisa: *See—*
Noguchi, Shunsaku; Obayashi, Mikihiko; Minamida, Isao; Kishimoto, Shoji; and Kawai, Kiyohisa, 3,746,751.

Kawamura, Osamu: *See—*
Sako, Eiji; and Kawamura, Osamu, 3,746,196.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Ojima, Masaki; and Arata, Masahiro, 3,746,324.

Kawatake, Koichi: *See—*
Hirasawa, Kotaro; Kawatake, Koichi; and Iwasaka, Tatsuo, 3,746,131.

Keating, Esmond, to United States of America, Agriculture. Process for refining glyceride oils and fats. 3,746,731, Cl. 260-426.000.

Keeler, Eugene R., to Timex Corporation. Electronic switch for timepieces. 3,745,760, Cl. 58-28.00r.

Keenan, Charles E.; and Power, William A., to Ametek Inc. Torque to electrical current transducer. 3,745,821, Cl. 73-141.00r.

Keiper, Arthur S., II, to Dentsply International Inc. Intra-oral evacuator system. 3,746,033, Cl. 137-205.000.

Keller, August; and Keller, Hans. Spacer member for reinforcing rods, in reinforced concrete construction. 3,745,737, Cl. 52-687.000.

Keller, Hans: *See—*
Keller, August; and Keller, Hans, 3,745,737.

Keller, Joseph R.: *See—*
Wachter, Vincent C.; Keller, Joseph R.; and Fellman, Frederick J., 3,746,408.

Kelsey-Hayes Company: *See—*
Jewell, Lisle Allen, Jr., 3,746,132.

Kemeny, George A.: *See—*
Fey, Maurice G.; Wolf, Charles B.; Azinger, Frederick A., Jr.; and Kemeny, George A., 3,746,830.

Kemner, Mark H.: *See—*

Kemner, Mark H., 3,746,364.

Kemner, Mark H., to Kemner, Mark H. Multiposition stabilizer with a plurality of wear surfaces. 3,746,364, Cl. 280-150.00c.

Keneman, Scott Allen; and Taylor, George William, to RCA Corporation. Electro-optical storage device. 3,747,075, Cl. 340-173.0lt.

Kennedy, Carl D.; and Weaver, Wallace R., to Continental Oil Company. Separation of organic sulfonyl chlorides. 3,746,759, Cl. 260-593.00r.

Kennedy, Neil James. Cartridge reloading dies. 3,745,875, Cl. 86-23.000.

Kennedy, William D., Jr.; and Gunn, Lawrence G. Cooking utensil. 3,745,911, Cl. 99-426.000.

Keserin, Ivan: *See—*
Koy, Hermann; and Keserin, Ivan, 3,745,620.

Kessler, Harry H.: *See—*
Moore, William H.; and Kessler, Harry H., 3,746,078.

Keto, Kalevi, to Spinner Osakeyhtio. False-twist spindle in a filament false-twist crimping machine. 3,745,755, Cl. 57-77.400.

Kida, Nobutoshi. Folding umbrella. 3,746,024, Cl. 135-20.000.

Kikuchi, Makoto, to Toyoda Koki Kabushiki Kaisha. Grinding machine with loader and work supporting shoes. 3,745,723, Cl. 51-103.0wh.

Kikuchi, Makoto, to Toyoda Koki Kabushiki Kaisha. Spindle head device with spindle axial adjusting means. 3,746,411, Cl. 308-168.000.

Kikumoto, Ryoji, to Mitsubishi Chemical Industries, Limited. Process for manufacturing 6-nitro-2-oximino-hexanoic acid derivatives. 3,746,757, Cl. 260-534.00r.

Kildishev, Vasily Semenovich; Kovalkov, Gely Alexeevich; Maznikin, Nikolai Sergeevich; Misjulin, Alexandr Vasilievich; and Lebeder, Alexandr Vladimirovich. Apparatus for measuring the insulation resistance of the rotor of a brushless synchronous machine. 3746,979, Cl. 324-51.000.

Kilmer, Lauren G., to Atlantic Richfield Company. Gas exploder apparatus with suction release. 3,746,120, Cl. 181-.5nc.

Kim, Kee W.: *See—*
Grove, Marvin H.; and Kim, Kee W., 3,746,303.

Kimberly-Clark Corporation: *See—*
Schwarz, Eckhard C. A.; and Bartels, Philip R., 3,746,574.

Kimura, Ichiro; Takahashi, Yoshiro; and Ito, Hideo, to Kumiai Chemical Industry Co., Ltd. Herbicidal composition of thiocarbamate and 3(3,4-dichlorophenyl)-1-methoxy-1-methylurea. 3,746,532, Cl. 71-100.000.

Kimura, Masakazu: *See—*
Nanamatsu, Satoshi; Kimura, Masakazu; and Doi, Kikuo, 3,747,022.

Kinberg, Benjamin: *See—*
Mayer, Richard J.; and Kinberg, Benjamin, 3,746,346.

Kindelan, James J., to Overmyer Mould Company of Pennsylvania. Apparatus for drilling escape and vent holes in die molds. 3,746,459, Cl. 408-37.000.

Kindl, Bruno: *See—*
Porta, Paolo Della; Giorgi, Tiziano A.; Kindl, Bruno; and Zucchinelli, Mario, 3,746,658.

King, Jack B., to General Motors Corporation. Purge control valve and system. 3,745,984, Cl. 123-136.000.

King, Josef: *See—*
Fichter, Walter; Armbruster, Otto; and King, Josef, 3,746,335.

Kingmann-White, Inc.: *See—*
Nolte, Claude B., 3,745,825.
Younger, George F., 3,745,826.

Kinnaird, Laird D.; Moorhead, Seth B., Jr.; and Casadevall, James L., to United States of America. Rain resistant, high strength, ablative nose cap for hypersonic missiles. 3,745,928, Cl. 102-105.000.

Kirchheim, Jean-Jacques, to Saint-Gobain. Method of and apparatus for the production of pads or mats of fibers from thermoplastic materials. 3,746,524, Cl. 65-6.000.

Kirillov, Vladimir Ivanovich; and Batyrev, Alexei Vasili..vich. Device for feeding welding wire or electrodes. 3,746,232, Cl. 226-187.000.

Kirkpatrick, George M.; and Wild, Norman R., to Syracuse University Research Corporation. Phased-array antenna. 3,747,098, Cl. 343-16.00r.

Kirschbaum, Charles J. Safety jack wheel for vehicles. 3,746,365, Cl. 280-150.00a.

Kishi, Takao: *See—*
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Kishimoto, Shoji: *See—*
Noguchi, Shunsaku; Obayashi, Mikihiko; Minamida, Isao; Kishimoto, Shoji; and Kawai, Kiyohisa, 3,746,751.

Kitajima, Masao: *See—*
Kondo, Asaji; Kitajima, Masao; and Miyano, Shizuo, 3,746,621.

Kitamora, Sadao: *See—*
Nomoto, Yoshihisa; Oguino, Masanori; Ueda, Seiichi; and Kitamora, Sadao, 3,746,786.

Kitamura, Motoharau: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.

Kitch, Paul Edward, to Scott Paper Company. Apparatus for producing positive or negative images on a light activatable, thermally developable, diazosulfonate reproduction material. 3,746,448, Cl. 355-106.000.

Kiwi Coders Corporation: *See—*
McKay, James G., 3,745,920.

Klatt, Peter: *See—*
Ruschig, Heinrich; Konig, Johann; Dittmar, Walter; Klatt, Peter; and Duwel, Dieter, 3,746,765.

Klaus, Tal E.: *See—*
Fox, Duane C.; Ichinose, Richard Y.; and Klaus, Tal E., 3,747,067.

Kleimann, Helmut: *See—*
Hammann, Ingeborg; Hoffmann, Peter; Kleimann, Helmut; Marouarding, Dieter; Offermann, Klaus; Ugi, Ivar; and Unterstenhofer, Gunter, 3,746,766.

Klima, James E.: *See—*
Hoerman, Kirk C.; Shklair, Irving L.; Klima, James E.; and Simonson, Lloyd G., 3,746,624.

Kluge, Johannes; Rabe, Peter; Schmidt, Otto; and Schleyer, Meinlof, to Demag Aktiengesellschaft. Suspension switch with gear segment slider and operating force regulating contact operating cams. 3,746,812, Cl. 200-153.00l.

Knapp, George P.; and Staples, Robert E., to Mount Hope Machinery Company. Liquid-lubricated roll. 3,746,129, Cl. 184-6.260.

Knavish, Leonard A.; Goldberg, Arnold J.; and Hilliard, William G., to PPG Industries, Inc. Method and apparatus for homogenizing viscous molten glass. 3,746,527, Cl. 65-136.000.

Knecht, Franklin J. Apparatus for dispersing liquids over the surfaces of objects. 3,745,973, Cl. 118-400.000.

Knitter, Heinz Wolfgang; and Veszelik, Josef, to Bunker Ramo Corporation. Housing assembly for contacts. 3,746,933, Cl. 317-101.0cc.

Knnningham, Ernest R.; and Dodson, Marshall, to Barr-Stalfort Company; division of Pittway Corporation. Vacuum crimping and filling head for aerosol containers. 3,745,741, Cl. 53-88.000.

Knockel, William J.; and Werner, Leo C., to Westinghouse Electric Corporation. End cap configuration for ceramic discharge lamp. 3,746,907, Cl. 313-318.000.

Knox, Raymond E.; and Teague, Roger W., to General Signal Corporation. Waste disintegrator rotor and ring assembly. 3,746,266, Cl. 241-46.00r.

Koah, Chester B. Infant carrier with tissue retainer. 3,746,390, Cl. 297-192.000.

Kobayashi, Hiroshi: *See—*
Asano, Hiroaki; and Kobayashi, Hiroshi, 3,745,660.

Kobayashi, Kengo, to Fujitsu Limited. Adaptive control system for numerical control of a cutting tool. 3,746,955, Cl. 318-561.000.

Kobayashi, Kengo; and Manabe, Mitsuo, to Fujitsu Limited. Circuit for driving an electric pulse motor. 3,746,959, Cl. 318-696.000.

Kobayashi, Terutomo: *See—*
Taketa, Katsumi; Miyoshi, Akeyoshi; and Kobayashi, Terutomo, 3,746,939.

Kobayashi, Yugoro, to Ricoh Co., Ltd. Diazo type developing device using a powder developing agent. 3,745,905, Cl. 95-89.00r.

Koch, Rudolf: *See—*
Mayer, Ehrhard; and Koch, Rudolf, 3,746,350.

Kocher, Hans; and Schmied, Peter, to Buren Watch Company S.A. Device for indication of the hour in a timepiece. 3,745,762, Cl. 58-85.500.

Koechner, Walter; and Debenedictis, Leonard Charles, to Union Carbide Corporation. Method and means for stabilizing the amplitude and repetition frequency of a repetitively Q-switched laser. 3,747,019, Cl. 331-94.500.

Koenig, John O. Boat elevating and supporting mechanism. 3,746,194, Cl. 214-450.000.

Koenig, Ulrich: *See—*
Stange, Karl; Jenne, Helmut; Weiss, Hans-Peter; and Koenig, Ulrich, 3,746,609.

Koezuka, Junji: *See—*
Kamei, Hisashi; Koezuka, Junji; and Imooka, Masanori, 3,746,512.

Kogel, Wilhelm Georg, to Aktiebolaget Electrolux. Apparatus for defrosting cooling units of absorption refrigeration systems. 3,745,783, Cl. 62-278.000.

Kohn, Karl Walter, to Societe d'Etudes de Machines Thermiques. Support for a nest of exhaust manifolds for internal combustion engines. 3,746,291, Cl. 208-68.00r.

Koike, Hiroshi. Electromagnetic linear motion device. 3,746,937, Cl. 318-122.000.

Koleman Company, Inc., The: *See—*
May, Randall L., 3,746,159.

Koleske, Joseph V.; and Magnus, George, to Union Carbide Corporation. Polyurethane based on blends of poly (oxycaproyl) diols and poly(oxytetraurethylene) diols. 3,746,665, Cl. 260-2.5an.

Kolle, Erwin: *See—*
Andres, Rudolf; Kolle, Erwin; and Binder, Rudolf, 3,746,393.

Kollmeyer, Willy D.; and Pilgram, Kurt H. G., to Shell Oil Company. Imidazolidinones. 3,746,704, Cl. 260-240.00f.

Koltuniak, Michael A.; and Rigney, James B., to Controlled Power Corporation. Modular power supply circuit. 3,746,967, Cl. 321-5.000.

Kondo, Asaji; Kitajima, Masao; and Miyano, Shizuo, to Fuji Photo Film Co., Ltd. Preparation of enzyme-containing microcapsule. 3,746,621, Cl. 195-63.000.

Konig, Johann: *See—*
Ruschig, Heinrich; Konig, Johann; Dittmar, Walter; Klatt, Peter; and Duwel, Dieter, 3,746,765.

Konopka, John G., to Warwick Electronics, Inc. Memory circuit. 3,746,886, Cl. 307-223.00r.

Koon, Homer E., Jr., to Firearm Development, Inc. Rifle bolt action. 3,745,683, Cl. 42-16.000.

Koon, Homer E., Jr., to Firearm Development, Inc. Rifle bolt action. 3,745,686, Cl. 42-16.000.

Koon, Homer E., Jr., to Firearm Development, Inc. Rotary magazine for bolt action rifle. 3,745,687, Cl. 42-19.000.

Kopenhaver, Kenneth Oscar: *See—*
Johnson, Erlon Fitch; and Kopenhaver, Kenneth Oscar, 3,747,048.

Koppers Company, Inc.: *See—*
Zarfoss, James R.; Snader, Earle S.; and Hale, Elden A., Sr., 3,745,907.

Korczykowski, Leonard Earnest: *See—*
Sheppard, Chester Stephen; and Korczykowski, Leonard Earnest, 3,746,760.

Korpel, Adrianus, to Zenith Radio Corporation. Acoustic imaging apparatus. 3,745,812, Cl. 73-67.50r.

Korta, Lawrence B.: *See—*
Corbell, Paul I.; Giovanelli, Alfred; and Korta, Lawrence B., 3,747,109.

Koskan, Larry P., to Nalco Chemical Company. Gas chromatography analysis of polymer. 3,746,509, Cl. 23-230.00r.

Koskinen, Esko Ilmari: *See—*
Asikainen, Niilo Kalervo; and Koskinen, Esko Ilmari, 3,745,879.

Kosman, Karel Jan Williams; Boivin, Louis-Philipp; and Fefer, Dennis, to Bell Canada-Northern Electric Research Limited. Light emitting devices. 3,746,853, Cl. 240-41.35d.

Kosowsky, Leo N.; Lovejoy, Curtis N.; and Cunniff, John G., to Auric Corporation. Apparatus for selective electroplating of strips. 3,746,630, Cl. 204-206.000.

Koster, Olav E., to Akzona Incorporated. Apparatus for controlling polymer pressure. 3,746,486, Cl. 425-146.000.

Kotera, Noboru; Nishikawa, Satoru; and Sakamoto, Hitoshi, to Dai Nippon Toryo Kabushiki Kaisha. Radiothermoluminescent materials and radiothermoluminescence dosimeters. 3,746,651, Cl. 252-301.40f.

Kotheimer, William C., to General Electric Company. Ground continuity checking system. 3,746,929, Cl. 317-18.00a.

Kotlar, Edward A. Shipping rack. 3,746,176, Cl. 211-13.000.

Kotler, Max; and Zuckman, Charles, to Dejur-Amsco Corporation. Motion picture projector. 3,746,441, Cl. 352-169.000.

Kotler, Max; and Grossman, Morris, to DeJur-Amsco Corporation. Motion picture sound projector with automatic film threading. 3,746,453, Cl. 352-158.000.

Kovac, Michael George, to RCA Corporation. Charge transfer circuits. 3,746,883, Cl. 307-221.00d.

Kovalkov, Gely Alexeevich: *See—*
Kildishev, Vasily Semenovich; Kovalkov, Gely Alexeevich; Maznikin, Nikolai Sergeevich; Misjulin, Alexandr Vasilievich; and Lebeder, Alexandr Vladimirovich, 3,746,979.

Kovats, Leslie P., to Anheuser-Bush, Incorporated. Dextrin and starch ethers. 3,746,699, Cl. 260-209.00r.

Koy, Hermann; and Keserin, Ivan, to Metallgesellschaft Aktiengesellschaft. Method of making corona-discharge electrode structures and assembly therefore. 3,745,620, Cl. 29-25.160.

Kraft, John, Sesame Corporation: *See—*
Anderson, James E., 3,746,553.

Kramer, Henry H.; Thompson, C. Sheldon; and Cosolito, Frank J., to Union Carbide Corporation. Method of determining the presence and amount of vanadium in an earth formation. 3,746,871, Cl. 250-270.000.

Kramer, Melvin G., to Datel Corporation. Apparatus for determining the validity of data received by data. 3,746,994, Cl. 325-320.000.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Anti-inflammatory agents. 3,746,706, Cl. 260-240.00f.

Kraus, Werner. Apparatus and method for aiding formation of bone forming material. 3,745,995, Cl. 128-82.100.

Krell, Leonard C. Carpet installation tool. 3,745,598, Cl. 7-8.000.

Kressel, Henry; and Hawrylo, Frank Zygmunt, to RCA Corporation. Semiconductor injection laser. 3,747,016, Cl. 331-94.50h.

Krishnaiyer, Ramesh: *See—*
Velicer, Wencel J.; Krishnaiyer, Ramesh; McLean, Michael B.; and LaMore, Donald J., Jr., 3,746,044.

Kristiansson, Erik, to Pullman Aktiebolag. Arrangement in tool changes for stamping and nibbling machines and the like. 3,745,646, Cl. 29-568.000.

Krob, Erwin; and Morell, Josef, to Vockenhuber, Karl and Hauser, Raimund. Recording or reproducing apparatus. 3,746,227, Cl. 226-36.000.

Kruger, Harry, GmbH: *See—*
Scheffer, Harry, 3,745,886.

Krusche, Georg: *See—*
Reicheneder, Franz; Dury, Karl; Krusche, Georg; and Burger, Heinz, 3,746,726.

Kubota, Yasuharu, to Sony Corporation. Television camera. 3,746,779, Cl. 178-54.0st.

Kugumiya, Shigenori: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.

Kuhdorf, Gunther; and Berndt, Joachim, to Bosch, Robert, G.m.b.H. Apparatus for electro-chemical processing of metallic workpieces. 3,746,632, Cl. 204-224.00m.

Kuhlmann, Vojine: *See—*
Nordmann, Joseph; Mattioda, Georges Dominique; and Loiseau, Gerrard Paul Marie Henri, 3,746,764.

Kuhne, Manfred; and Vogel, Christian. 2-Alkylthio-4,6-di(alkylamino)-s-triazines. 3,746,710, Cl. 260-249.800.

Kumagai, Yoshikazu: *See—*
Iritani, Tadamitsu; and Kumagai, Yoshikazu, 3,746,880.

Kumiai Chemical Industry Co., Ltd.: *See—*
Kimura, Ichiro; Takahashi, Yoshiro; and Ito, Hideo, 3,746,532.

Kunkel, Ernest O.: *See—*
Young, James W.; Cason, George A.; and Kunkel, Ernest O., 3,746,107.

Kuper, Donald G.; and Hughes, William B., to Phillips Petroleum Company. Production of oxygenated organic compounds. 3,746,747, Cl. 260-485.00r.

Kuper, Donald G., to Phillips Petroleum Company. Process for preparation of aromatic carboxylates. 3,746,752, Cl. 260-515.00p.

Kurata, Kazuhiro: *See—*
Aoki, Masaharu; Kasano, Hiroyuki; Kurata, Kazuhiro; and Ogirima, Masahiko, 3,746,943.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Hotta, Tetsuya; Okuda, Kensuke; and Sugita, Minoru, 3,746,573.

Kuriia, Masahiro, to Kabushiki Kaisha Suwa Seikosha. Electric and electronic timepiece. 3,745,758, Cl. 58-23.00a.

Kurita Water Industries Ltd.: *See—*
Watanabe, Kouichi, 3,746,174.

Kurosawa, Moriyoshi, to Kabushiki Kaisha Daini Seikosha. Electric timepiece. 3,745,759, Cl. 58-28.00r.

Kurth, Klaus; and Rahmig, Hermann, to Voith, J. M., GmbH. Method of manufacture and operation of ribbed member for treatment of fibrous suspensisns. 3,745,645, Cl. 29-530.000.

Kurtz, Kenneth J. Bed moving device. 3,745,597, Cl. 5-328.000.

Kuse, Takashi, to Tokyo Shibaura Electric Co., Ltd. Sealing alloy. 3,746,536, Cl. 75-124.000.

Kuwada, Yutaka: *See—*
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 3,746,701.

Kwikee Enterprises, Inc.: *See—*
Nagy, Emery J., 3,745,595.

Kyoraku Kogyo Co., Ltd.: *See—*
Nagai, Tomomasu, 3,746,204.

La Fata, John Edward: *See—*
LaFata, John Edward; and Cuccio, John D., 3,745,693.

Lachowicz, Donald R., to Texaco Inc. Nitroketonized amides and their method of preparation. 3,746,729, Cl. 260-404.500.

Lackey, Ray R.; and Bross, William T., to Sybron Corporation. Finger actuated surgical electrode holder. 3,746,814, Cl. 200-157.000.

Ladine, Duane A.: *See—*
McCullough, Lester E.; and Ladine, Duane A., 3,746,106.

Ladish Co.: *See—*
Gauthier, Roland A., 3,745,805.

LaFata, John Edward; and Cuccio, John D., 1/2 to La Fata, John Edward and 1/2 to Cuccio, John D. Swing-around bubble-making toy. 3,745,693, Cl. 46-7.000.

Lahr, Thomas N.; and Volkmann, Richard E., to Minnesota Mining and Manufacturing Company. Organic, radioisotope-containing, carbonaceous matrix heated in inert atmosphere. 3,746,650, Cl. 252-301.10r.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Caillat, Maurice; and Perrin, Georges, 3,745,784.

Laitram Corporation, mesne: *See—*
Fowler, John T., 3,746,842.

Laitram Corporation, The: *See—*
Lapeyre, James Martial, 3,745,609.

Lamb, John T., to Tappan Company, The. Interlock circuit. 3,746,938, Cl. 317-136.000.

LaMore, Donald J., Jr.: *See—*
Velicer, Wencel J.; Krishnaiyer, Ramesh; McLean, Michael B.; and LaMore, Donald J., Jr., 3,746,044.

Lancini, Giancarlo: *See—*
Cavalieri, Bruno; and Lancini, Giancarlo, 3,746,705.

Land, Karl M., to Cities Service Oil Company. Means for stabilizing wellbores. 3,746,092, Cl. 166-207.000.

Landon, Steven, to Washex Machinery Corporation. Process for removing soil from and for treating cleaning mops and rags. 3,746,508, Cl. 8-141.000.

Lange, Ronald A.: *See—*
Pace, Frank P.; Lange, Ronald A.; and Arams, Frank R., 3,746,454.

Langen & Co.: *See—*
Strauff, Gunter, 3,745,769.

Langen, Christianus Petrus: *See—*
Langen, Johannes Christiana; and Langen, Christianus Petrus, 3,746,316.

Langen, Johannes Christiana; and Langen, Christianus Petrus. Coupling means for containers such as two rotatably mounted drums. 3,746,316, Cl. 259-57.000.

Langewis, Cornelis, to Kaiser Aluminum & Chemical Corporation. Metal press. 3,745,633, Cl. 29-200.00b.

Langewis, Cornelis; and Smith, Arthur Dean, to Kaiser Aluminum & Chemical Corporation. Container forming apparatus. 3,745,804, Cl. 72-349.000.

Lapeyre, James Martial, to Laitram Corporation, The. Apparatus for removing shells from crustacea. 3,745,609, Cl. 17-23.000.

Lapp, John; and Weiler, Norbert R., to McGraw-Edison Company. Electrical capacitor. 3,746,953, Cl. 317-259.000.

Larsen, James P. Power drive seal valve. 3,746,302, Cl. 251-103.000.
Larsen, Reidar G.: *See—*
Hogan, Warren R.; and Larsen, Reidar G., 3,746,932.
Larson, Arvid. Lighter and pipe tamper device. 3,746,013, Cl. 131-247.000.
Larson, Carl T. Fishing apparatus. 3,745,684, Cl. 43-24.000.
Larsson, Gosta Ingemar: *See—*
Nystrom, Kjell Signar; and Larsson, Gosta Ingemar, 3,746,062.
Lassen Foods, Inc.: *See—*
Schlotthauer, Wayne W., 3,745,909.
Latash, Jury Vadimovich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Iarailevich; Latash, Jury Vadimovich; and Bagloi, Vitaly Mikhailovich, 3,746,075.
Laughlin, James P.; and McCullough, Wilfred W., to Whirlpool Corporation. Refrigeration apparatus. 3,745,786, Cl. 62-419.000.
Laughman, Glenn D., 20% to Lee, Raymond, Organization, Inc., The. Powered apparatus for water travel saddle. 3,745,961, Cl. 115-6.100.
Laupman, Robert Ronald, to Novanex Automation N.V. Control device for luminescent lamps. 3,746,919, Cl. 315-105.000.
Lavering, Gordon R.; and Eallonardo, Charles M., to Varian Associates. Heat dissipation device. 3,746,087, Cl. 165-185.000.
Layne, Robert W. Prefabricated modular housing. 3,745,730, Cl. 52-236.000.
Le Diberder, Michel Alain Rene; Ferrieu, Gilbert Marie Marcel; and Hamel, Roger Bernard Jules, to Telecommunications Radioelectriques et Telephoniques T.R.T. Coder-decoder for use in a delta-transmission system. 3,746,990, Cl. 325-38.00b.
Le Viet, Toai, to Societe d'Assistance Technique pour Produits Nestle S.A. Split folded wave guide with leakage preventive apertures. 3,746,822, Cl. 219-10.550.
Lear Siegler, Inc.: *See—*
Borns, David R., 3,746,363.
Leason, Hayden, to Scovill Manufacturing Company. Method of making self-supporting filter with positioning of a tubular sleeve in a mold. 3,746,595, Cl. 156-245.000.
Lebeder, Alexandr Vladimirovich: *See—*
Kildishev, Vasily Semenovich; Kovalkov, Gely Alexeevich; Maznikin, Nikolai Sergeevich; Misjulin, Alexandr Vasilievich; and Lebeder, Alexandr Vladimirovich, 3,746,979.
Leclercq, Francis. Yarn feed mechanism with constant throughput and pneumatic tension regulation. 3,746,226, Cl. 226-25.000.
Lee, Raymond, Organization, Inc., The: *See—*
Benoit, Edith C., 3,746,181.
Brown, Samuel E., Jr., 3,745,691.
Copeland, Ralph L., 3,746,577.
Davis, Thomas L., 3,746,383.
Diez, Louis, 3,745,871.
Laughman, Glenn D., 3,745,961.
Ripley, Marion M., 3,746,384.
Lee, Richard J. Bullet mold. 3,745,873, Cl. 86-1.000.
Leenhousts, Albert C., to Superior Electric Company, The. Motor control for a stepping motor. 3,746,958, Cl. 318-696.000.
Leffingwell, John Charles, to Reynolds, R. J., Tobacco Company. Tobacco product. 3,746,010, Cl. 131-17.00r.
Legg (Industries) Limited: *See—*
Foster, George William, 3,746,884.
Leidtke, Ronald R.: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Leidtke, Ronald R.; and Villasana, Armando P., 3,745,696.
Leitnaker, James M.; and Spear, Karl E., II, to United States of America, Atomic Energy Commission. Stabilized uranium or uranium-plutonium nitride fuel. 3,746,616, Cl. 176-67.000.
L'Electronique Appliquee: *See—*
Franchi, Pierre Paul, 3,745,829.
Lemery, Douglas J. Saw chain. 3,745,870, Cl. 83-833.000.
Lender, Adam, to GTE Automatic Electric Laboratories Incorporated. Digital method of generating a continuous phase FSK linesignal in response to an asynchronous binary input signal. 3,746,787, Cl. 178-6.00a.
Lenhart, Robert L., to Gale, W. D., Inc. Emergency telephone box. 3,746,207, Cl. 220-36.000.
Leonard, Louis H., Jr., to Carrier Corporation. Absorption refrigeration system. 3,745,780, Cl. 62-141.000.
Leopold, Wilbur R.; and Smith, John J.; deceased (by Smith, Beatrice A.; executor), to Mueller Co. Gas meter setting or the like. 3,746,371, Cl. 285-30.000.
Lettieri, John; and Pett, Roger H., to International Business Machines Corporation. Accumulator for a key entry device. 3,746,839, Cl. 235-61.80r.
Leventhal, Jack. Suspension means for automobile mufflers. 3,746,127, Cl. 181-72.000.
Lever Brothers Company: *See—*
McNaught, John P., 3,746,551.
Payne, Laurence Sydney; Ward, Peter; and Wells, Reginald David, 3,746,711.
Lewis, Alvin; and Destito, Anthony J., to Embosograf Corporation of America. Frictionless cam-operated apparatus. 3,745,841, Cl. 74-107.000.
Lewis, Edgar R. Self securing socket for fishing rod. 3,745,690, Cl. 43-21.200.
Lewis, Ivor J., to Westinghouse Electric Corporation. Quick operating device for a valve. 3,746,299, Cl. 251-25.000.
Lewis, J. Stephen: *See—*
Sapkus, Jurgis; Lewis, J. Stephen; Leidtke, Ronald R.; and Villasana, Armando P., 3,745,696.
Lewis, Keith, to Lucas, Joseph, (Industries) Limited. Electric switches. 3,746,359, Cl. 200-67.00g.
Lewis, Robert R.: *See—*
Eisele, Hermann; and Lewis, Robert R., 3,745,933.
Licata, Joseph: *See—*
Spira, Joel S.; and Licata, Joseph, 3,746,923.
Lidkopings Mehaniska Verktads AB: *See—*
Johansson, Erik Lennart Waldemar, 3,746,523.
Lieber, Clement E.: *See—*
Blake, Lawrence W.; Bett, Bruce D.; and Lieber, Clement E., 3,746,003.
Life Technology Corporation: *See—*
Rothstein, Edwin C.; and Ravdin, Bruce, 3,745,831.
Lilly, Eli, and Company: *See—*
Chakrabarti, Jiban Kumar; and Slomo, Stephen, 3,746,761.
Doherty, George O. P., 3,746,531.
Lin, Chao-Han, to National Cash Register Company, The. Mark-forming record materials. 3,746,562, Cl. 117-36.200.
Linde, Leonard J., to Gulton Industries, Inc. Contact assembly for switches. 3,746,819, Cl. 200-170.00a.
Lindelow, Claes-Goran: *See—*
Englund, Gosta Roland; Israelson, Rolf B.G.; Mattsson, Mats E.; Lindelow, Claes-Goran; and Maxe, Sven-Erik, 3,747,090.
Lindemann, Glen W.: *See—*
Zeldman, Maurice I.; Lindemann, Glen W.; and Mahidhara, Murali, 3,745,851.
Lindop, Roy: *See—*
Sedgwick, Gordon; Lindop, Roy; and Nelson, Tom Worsley, 3,746,374.
Lindsay, Richard P.: *See—*
Hahn, Robert S.; Lindsay, Richard P.; Robillard, Edward G.; and Youden, David H., 3,745,710.
Lindsay Specialty Products Limited: *See—*
Pennypacker, Frank C., 3,747,028.
Lindstedt, Sven; Treiber, Laszlo; Frolunda, Vastra; Stollnberger, Peter; and Tausch, Walter, to Zeiss-Stiftung, Carl. Method of photometrically plotting light scattering objects. 3,746,869, Cl. 250-218.000.
Lipe, Gordon C. Attachment for hand drills. 3,746,460, Cl. 408-112.000.
Liqui-Trol Systems, Inc.: *See—*
Gray, John; and Anderson, Gene W., 3,746,471.
Lisa, Miloslav: *See—*
Mohelnicky, Josef; Zmailik, Josef; and Lisa, Miloslav, 3,746,051.
Little, Arthur J.; and Mayer, William R., to Stewart-Warner Corporation. Electromagnetic flasher with lamp failure sensing means. 3,747,061, Cl. 340-80.000.
Little, Carl H., to Weber-Knapp Company. Counter balance support. 3,745,608, Cl. 16-190.000.
Little, William S., Jr., to Xerox Corporation. Method of vacuum evaporation. 3,746,571, Cl. 117-105.400.
Littlewood, Peter Stuart, to Sandoz Ltd. 1-(5')-Phthalidyl-3-phenylpyrazolines. 3,746,720, Cl. 260-310.00d.
Litton Systems, Inc.: *See—*
Stiles, John C.; Tuffias, Robert H.; and Blakely, Roger W., Jr., 3,746,407.
Litvin, Robert L.: *See—*
Litvin, Robert L.; and Spadaro, Giorgio L., 3,745,733.
Litvin, Robert L.; and Spadaro, Giorgio L., 54% to Litvin, Robert L. and 46% to Marino, Louis L. Panel construction for modular bathrooms. 3,745,733, Cl. 52-262.000.
Livelsberger, Bert V., to Aluminum Company of America. Method of extruding tubular products. 3,745,803, Cl. 72-265.000.
Livshits, Leopold Davydovich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.
Ljung, Hans Glorg; Barrner, Dan Johannes; and Grellsson, Karl Gustav, to Aktiebolaget Electrolux. Vacuum cleaner having signal for indicating absence of dust bag. 3,745,965, Cl. 116-112.000.
Lloyd, William A. Inonic vacuum pump. 3,746,474, Cl. 417-49.000.
LoCascio, Jack J.; and Astor, Edward, to International Playtex Corporation. Brassiere. 3,746,008, Cl. 128-498.000.
Lockheed Aircraft Corporation: *See—*
Cross, John W., 3,746,119.
Lodi, Robert J.; and Wegener, Horst A.R., to Sperry Rand Corporation. Integrated static MNOS memory circuit. 3,747,072, Cl. 340-172.500.
Loeb, Alfred A.: *See—*
Mertz, Dale H.; Loeb, Alfred A.; and Falkowski, Edmund W., 3,745,926.
Logan Co.: *See—*
Hilger, Edwin T.; and Miller, James S., 3,746,148.
Lohikoski, Timo J. J.; Rantanen, Mauri V.; and Hocksell, Heimo H., to Outokumpu Oy. Apparatus for upward casting. 3,746,077, Cl. 164-281.000.
Loiseau, Gerrard Paul Marie Henri: *See—*
Nordmann, Joseph; Mattioda, Georges Dominique; and Loiseau, Gerrard Paul Marie Henri, 3,746,764.

Lolkema, Jan, to Scholten-Honig Research N.V. Process for the manufacture of redispersible hydrophobic starch derivatives. 3,746,690, Cl. 260-77.5as.
Lombardo, Daniel F.; and Splain, Walter E., to Picker Corporation. Protective circuit for X-ray tube and method of operation. 3,746,862, Cl. 250-93.000.
Long Island Lighting Company: *See—*
Pansini, Anthony J., 3,747,104.
Long, Robert L.: *See—*
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Loquai, John R.: *See—*
Rutherford, Robert C.; and Loquai, John R., 3,745,637.
Lorenz, Jerome L., to Ranco Incorporated. Condition responsive A.C. phase angle control circuitry. 3,746,887, Cl. 307-252.00b.
Louet, Jean Marie Augustin Jacques. Barge for ferying a trailer. 3,745,954, Cl. 114-.50r.
Lovejoy, Curtis N.: *See—*
Kosowsky, Leo N.; Lovejoy, Curtis N.; and Cunniff, John G., 3,746,630.
Lovig, Jack Dean. Earth boring apparatus. 3,746,103, Cl. 173-24.000.
Lowell Manufacturing Company: *See—*
Hammes, Josef, 3,746,125.
Lowrance Electronics Mfg., Corporation: *See—*
Austin, Garland R., 3,747,053.
Lucas, Joseph, (Industries) Limited: *See—*
Bloom, Joseph Lewis, 3,745,767.
Cryer, Edward, 3,746,803.
Harris, John Derek, 3,745,635.
Ifield, Richard Joseph, 3,746,406.
Lewis, Keith, 3,746,359.
Sedgwick, Gordon; Lindop, Roy; and Nelson, Tom Worsley, 3,746,374.
Williams, David Gordon, 3,747,062.
Williams, Malcolm; and Hodgson, Duncan Barry, 3,745,817.
Wright, Maurice James, 3,746,962.
Ludwig, Clarence H. Slicing blade. 3,745,869, Cl. 83-788.000.
Luke, Michael O.: *See—*
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Lumenition Limited: *See—*
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Ford, Eric Harold; and Tate, Brian Christopher, 3,746,988.
Lummus Company, The: *See—*
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Lummus Industries, Inc.: *See—*
Van Doorn, Donald W.; and Pease, William C., III, 3,746,465.
Luthi, Oscar, to Improved Machinery Inc. Pump having discharge baffle means. 3,746,482, Cl. 418-201.000.
Lutron Electronics Co., Inc.: *See—*
Spira, Joel S.; and Licata, Joseph, 3,746,923.
Ly, Manuel G.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,746,753.
Lyon, Robert J., to United States of America, Navy. Destructor sterilizer. 3,745,922, Cl. 102-16.000.
M & J Development Company: *See—*
Grove, Marvin H.; and Kim, Kee W., 3,746,303.
M & J Valve Company: *See—*
Grove, Marvin H.; and Kim, Kee W., 3,746,303.
M & W Gear Company, Inc.: *See—*
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M&J Valve Company: *See—*
Ottenstein, Sidney Allan, 3,747,082.
Maark Corporation: *See—*
Vaughn, George A.; and Hargrave, Richard D., 3,745,729.
Maas, James F.: *See—*
Spindel, Abraham; and Maas, James F., 3,746,429.
Mabuchi, Kenichi, to Mabuchi Motor Co., Ltd. Device for automatically lowering and landing an electric model plane. 3,745,699, Cl. 46-243.0av.
Mabuchi Motor Co., Ltd.: *See—*
Mabuchi, Kenichi, 3,745,699.
MacDonald, Stanley W.; and Mottl, George. Printing plate saddle with living hinge. 3,745,921, Cl. 101-378.000.
MacDonnell, Robert W., to Unity Railway Supply Co., Inc. AB-type piston assembly shipping package. 3,746,153, Cl. 206-46.000.
Maciolek, Joseph R.; and Wallace, John J., to United Aircraft Corporation. Multi-lift aircraft control system. 3,746,279, Cl. 244-2.000.
Mack Trucks Inc.: *See—*
Pekar, Frank J., Jr.; and Eisenberg, Eugene, 3,745,980.
MacLean, Alexander Fiske: *See—*
Stautzenberger, Adin Lee; and MacLean, Alexander Fiske, 3,746,750.
Madsen, Bernhardt; Pozsony, Edward R.; and Collin, Everett E., to U.S. Packaging Corporation, mesne. Apparatus and method for skin packaging article. 3,745,739, Cl. 53-22.00a.
Mageli, Orville Leonard: *See—*
Bafford, Richard Anthony; Kamens, Ernest Rudolph; and Mageli, Orville Leonard, 3,746,735.
Magna-Graphics Corporation: *See—*
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Magnavox Company, The: *See—*
Heim, David E., 3,746,989.
Magne, Frank C.: *See—*
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,746,722.
Magne, Frank C.; Mod, Robert R.; Sumrell, Gene; and Parker, Winfred E., to United States of America, Agriculture. N-Substituted fatty acid amide lubricants. 3,746,644, Cl. 252-47.500.
Magnus, George: *See—*
Koleske, Joseph V.; and Magnus, George, 3,746,665.
Mahidhara, Murali: *See—*
Zeldman, Maurice I.; Lindemann, Glen W.; and Mahidhara, Murali, 3,745,851.
Maier, Gerhard. Apparatus for cutting pre-comminuted material into chips. 3,746,269, Cl. 241-244.000.
Maier, Volker Elmar, to Imperial Chemical Industries of Australia and New Zealand Limited. Purification of tetramisole. 3,746,718, Cl. 260-306.700.
Mains, Harold E.; and Oehlschlaeger, Herman F., to Emery Industries, Inc. Process for ozonizing low molecular olefins. 3,746,756, Cl. 260-533.00r.
Majewski, Zbigniew Jan, to Australian Paper Manufacturers Limited. Manufacture of boxes from corrugated board and like materials. 3,746,593, Cl. 156-207.000.
Makhrov, Viktor Vladimirovich: *See—*
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Malarkey, Edward C.: *See—*
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Malis, Jerry L.; and Rosenthale, Marvin E., to American Home Products Corporation. Anti-ulcer therapy. 3,746,495, Cl. 429-319.000.
Malkki, Eino Kalervo; and Silde, Valentin. Method of making a combined exhaust pipe and silencer. 3,745,632, Cl. 29-157.00r.
Mallinckrodt Chemical Works: *See—*
Goldberg, Morton E., 3,746,714.
Mallory Engineering Inc.: *See—*
Mallory, Roy E., 3,746,080.
Mallory, Roy E., to Mallory Engineering Inc. Environmental chamber. 3,746,080, Cl. 165-20.000.
Malmin, Oscar. Endodontic irrigating instrument. 3,745,655, Cl. 32-90.00r.
Maltby, Frederick L., to Drexelbrook Controls, Inc. Measuring characteristics of materials by using susceptive and conductive components of admittance. 3,746,975, Cl. 324-65.00r.
Manabe, Mitsuo: *See—*
Kobayashi, Kengo; and Manabe, Mitsuo, 3,746,959.
Mandula, Joseph M., Jr.; Fox, John B.; and Bricker, John K., to Republic Steel Corporation. Billet scanning mechanism using a probe carrying drum rotatable about the billet and pivotably mounted relative thereto. 3,746,972, Cl. 324-37.000.
Mango, Juan. Rescue balloon kit. 3,746,285, Cl. 244-98.000.
Mannesmannrohren Werke G.m.b.H.: *See—*
Born, Kurt; Neuhoff, Kurt-Walter; and Wesemann, Karl Friedrich, 3,746,050.
Mannherz, Elmer D.; and Yard, John S., to Fischer & Porter Co. Insert-type electromagnetic flowmeter. 3,745,824, Cl. 73-194.0em.
Marathon Oil Company: *See—*
Norton, Charles J.; and Falk, David O., 3,746,094.
Marbet, Roman, to Hoffman-La Roche Inc. Process for the manufacture of polyene acids. 3,746,730, Cl. 260-413.000.
Marcla, Americo E.; and Gehrke, Gerard W., to Torrington Company, The. Unidirectional clutch. 3,746,136, Cl. 192-45.000.
Marcona Corporation: *See—*
Kastrinos, Arthur, 3,746,268.
Marcuzzi, Anthony T.: *See—*
Francis, Reid E.; and Marcuzzi, Anthony T., 3,745,703.
Mare, Ernest. Scrubbing apparatus and method. 3,745,745, Cl. 5-95.000.
Marek, Alois, to Aktiengesellschaft Brown, Boveri & Cie. Semiconductor structure incorporating tunnel diodes located in the path of the main current flow. 3,746,948, Cl. 317-235.00r.
Marforio, Nerino, to S.p.A. Virginio Rinoldi & C. Needle driving device for sewing machines. 3,745,951, Cl. 112-221.000.
Marino, Francis C., to Digitronics Corporation. Circuit for switching currents through inductive loads. 3,746,927, Cl. 317-11.00b.
Marino, Louis L.: *See—*
Litvin, Robert L.; and Spadaro, Giorgio L., 3,745,733.
Maritsas, Dimitris. Generating pseudo-random sequences. 3,746,847, Cl. 235-152.000.
Markley, Finley W., to United States of America, Atomic Energy Commission. Compact dialyzer. 3,746,175, Cl. 210-321.000.
Marlin Toy Products, Inc.: *See—*
Thornell, Ernest L., 3,745,695.
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Hammann, Ingeborg; Hoffmann, Peter; Kleimann, Helmut; Marouarding, Dieter; Offermann, Klaus; Ugi, Ivar; and Unterstenhofer, Gunter, 3,746,766.
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Marshall, Clifford D.; Byrd, Paul S.; and Dante, Mark F., to Shell Oil Company. Process for curing polyepoxides with polycarboxylic acid salts of an imidazole compound and compositions thereof. 3,746,686, Cl. 260-47.0en.
Marshall, John J.; and Dykehouse, David B., to Progressive Dynamics, Inc. Fluorescent lamp circuit with low voltage supply. 3,746,921, Cl. 315-246.000.
Marsland, William P.; and Sharp, Marvin L., to Shell Oil Company. Paste compositions for controlling first instar bot larvae and endoparasites in horses. 3,746,490, Cl. 424-219.000.

Martin, Harold B.; and Rogg, Herman O., to Graber-Rogg, Inc. Musical keyboard. 3,745,874, Cl. 84-433.000.

Martin, Mervin W. Cattle and hog watering apparatus. 3,745,977, Cl. 119-73.000.

Martin, Roy A.; and Pittman, Clarence E. Voting machine. 3,746,248, Cl. 235-51.000.

Martin, Roy A.; and Pittman, Clarence E. Voting machine. 3,746,249, Cl. 235-54.00f.

Martin, Wilhelm; and Rieger, Werner, to Glanzstoff AG. Profiled electrode for electro-erosive boring. 3,746,827, Cl. 219-69.00e.

Martin-Municio, Vicente: *See—*
Vian-Ortuno, Angel; and Martin-Municio, Vicente, 3,745,668.

Martino, William L., Jr., to Honeywell Information Systems Inc. Memory write circuit. 3,747,076, Cl. 340-173.00r.

Martt, Judson W., to National Steel Corporation. Fluid bearing support for tiltable metallurgical vessels. 3,746,328, Cl. 266-36.00p.

Maruta, Iwao: *See—*
Arai, Haruhiko; Horin, Shoji; and Maruta, Iwao, 3,746,677.

Maruta, Koyoko: *See—*
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Maruta, Yoshi: *See—*
Arai, Haruhiko; Horin, Shoji; and Maruta, Iwao, 3,746,677.

Marvin, John R. Lawn block system. 3,745,701, Cl. 47-33.000.

Maschinenfabrik Ettlingen, Freidrich Pfeiffer KG: *See—*
Gauger, Friedhelm, 3,746,494.

Masi, James Vincent. Liquid crystal cell and method for its manufacture. 3,746,426, Cl. 350-160.0lc.

Mason, George W., to General Motors Corporation. Turbomachine rotor. 3,746,469, Cl. 416-213.000.

Mason, H. C., & Associates, Inc.: *See—*
Mason, Howard C., 3,746,065.

Mason, Howard C., to Mason, H. C., & Associates, Inc. Process and apparatus for veneer cutting. 3,746,065, Cl. 144-309.00k.

Mason, Kenneth A., to Honeywell Inc. Oculometer focus monitoring. 3,746,432, Cl. 351-6.000.

Massachusetts Institute of Technology: *See—*
Phelan, Robert J.; and Dimmock, John D., 3,746,867.

Massie, Stephen N., to Universal Oil Products Company. Purification of polybasic acids. 3,746,755, Cl. 260-525.000.

Masterpiece Inc.: *See—*
Strony, Gloria L., 3,746,601.

Mastner, Jiri: *See—*
Iten, Paul; and Mastner, Jiri, 3,747,025.

Mathers, James E.; Mikus, Felix F.; and Yale, Ramon L., to GTE Sylvania, Incorporated. Method for producing europium activated yttrium vandate phospor. 3,746,652, Cl. 252-301.40r.

Mathevosian, Ervand: *See—*
Brean, John W.; and Mathevosian, Ervand, 3,746,430.

Mathias, Richard G.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,746,420.

Mathiesen, Odd: *See—*
Poppe, Dag; Mathiesen, Odd; and Holmboe, Christian Fredrik, 3,747,107.

Matkan, Josef, to Canon Kabushiki Kaisha, mesne. Apparatus for signal recording on insulators. 3,747,119, Cl. 346-74.0es.

Matson, Gale W.: *See—*
Deckert, Fred W.; and Matson, Gale W., 3,746,068.

Matsumoto, Tadashi: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.

Matsushima, Masatoshi; and Nishinomiya, Makoto, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Blast furnace structure. 3,746,327, Cl. 266-25.000.

Matsushita Denko Kabushiki Kaisha: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.

Matsushita Electric Works, Ltd.: *See—*
Morimoto, Ikohisa; Fujimoto, Hiroaki; Yamada, Kiyoshi; and Hisano, Kowashi, 3,747,035.
Okamoto, Shinsuke; Unoue, Hiromitsu; Ohasi, Hirosi; Mori, Hirokazu; and Kawaguchi, Shojiro, 3,747,058.

Matsushita Electronics Corporation: *See—*
Kano, Gota; Iizuka, Mutsuo; Fujiwara, Shohei; Hasegawa, Hiromasa; and Sawaki, Tsukasa, 3,746,950.

Matte, Roger A. Crown-pinion gear drive for model railroad. 3,745,849, Cl. 74-416.000.

Mattel, Inc.: *See—*
Carabet, George F.; Holland, Andrew M.; Morris, Joseph P.; Pester, William B.; and Pinkerton, Kennteh R., 3,746,439.
Sapkus, Jurgis; Lewis, J. Stephen; Leidtke, Ronald R.; and Villasana, Armando P., 3,745,696.
Summerfield, William F.; and Nuttall, Fleet E., 3,746,836.

Matthey, William. Edge lath for stair step. 3,745,606, Cl. 16-10.000.

Matthias, Karl, to Bopp and Reuther GmbH. Valve construction. 3,746,304, Cl. 251-327.000.

Mattioda, Georges Dominique: *See—*
Nordmann, Joseph; Mattioda, Georges Dominique; and Loiseau, Gerrard Paul Marie Henri, 3,746,764.

Mattsson, Mats E.: *See—*
Englund, Gosta Roland; Israelson, Rolf B.G.; Mattsson, Mats E.; Lindelow, Claes-Goran; and Maxe, Sven-Erik, 3,747,090.

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Maxe, Sven-Erik: *See—*
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Maxwell Laboratories, Inc.: *See—*
Fitch, Richard A.; and Crewson, Walter F. J., 3,746,881.

May, Randall L., to Koleman Company, Inc., The. Cartridge package for a sanitary toilet. 3,746,159, Cl. 206-56.00r.

Mayberry, Lee G., to MayRich Specialty Company. Hood. 3,745,908, Cl. 98-115.0lh.

Mayer, Ehrhard; and Koch, Rudolf. Sealing assembly with pump device. 3,746,350, Cl. 277-67.000.

Mayer, Karl, Textilmaschinenfabrik G.m.b.H.: *See—*
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Mayer, Manfred: *See—*
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Mayer, Richard J.; and Kinberg, Benjamin. Acoustic phonographic apparatus. 3,746,346, Cl. 274-9.00r.

Mayer, Rollin P.: *See—*
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Mayer, Siegfried: *See—*
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Maykemper, Alfred: *See—*
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MayRich Specialty Company: *See—*
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Mazac, Frank P.: *See—*
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Maznikin, Nikolai Sergeevich: *See—*
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Mc Mahon, Maurice T., Jr., to International Business Machines Corporation. Testing of metallization networks on insulative substrates supporting semiconductor chips. 3,746,973, Cl. 324-51.000.

McAuliff, Dan: *See—*
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McCarter, Robert J., to United States of America, Commerce. Apparatus for measuring the rate at which vapors are evolved from materials during thermal degradation. 3,745,810, Cl. 73-15.00r.

McCarthy, Brian N.: *See—*
Alcivar, Ernesto A., 3,746,789.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Process of preparing finely divided thermoplastic resins. 3,746,681, Cl. 260-29.6pm.

McClaren, Jay L. Mobile storage bin. 3,746,395, Cl. 298-27.000.

McCormick, Robert J.: *See—*
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McCullough, Lester E.; and Ladine, Duane A., to Goldak Co., Inc., The. Boring bit locator. 3,746,106, Cl. 175-45.000.

McCullough, Wilfred W.: *See—*
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McDonnell Douglas Corporation: *See—*
Farr, Alton E.; Welch, Graydon L.; and Wood, Lorin A., 3,746,284.

McGee, Donald J., to Dura Corporation. Individual foil spring tandem suspension. 3,746,361, Cl. 280-104.50r.

McGee, Sieney. Fishing device. 3,745,692, Cl. 43-17.500.

McGill, Jack W., to Allis-Chalmers Corporation. Distributed tapped transformer winding and method of winding same. 3,747,038, Cl. 336-150.000.

McGraw-Edison Company: *See—*
Lapp, John; and Weiler, Norbert R., 3,746,953.

McGuire, Harold P. Automobile polyester body filter. 3,746,670, Cl. 260-7.500.

McIntosh, Brian H.: *See—*
Nystrand, Ernst Daniel; and McIntosh, Brian H., 3,746,592.

McIntosh, Ian Arthur; Bowers, Norman Josh; and Bowers, Brian Alfred, to Air Advantage (Australia) Pty., Limited. Rock working implement carrier. 3,746,104, Cl. 173-43.000.

McIntosh, Kenneth W., to Goodyear Tire & Rubber Company, The. Method for application of viscous hot melt adhesive. 3,746,570, Cl. 117-102.00a.

McIntyre, Mary Barbara. Pop-up pocket carrying bag. 3,746,066, Cl. 150-33.000.

McIver, Donald A., to Westinghouse Electric Corporation. Method and apparatus for providing sequential turn-on and turn-off control signals for a chopper. 3,747,000, Cl. 328-75.000.

McKay, James G., to Kiwi Coders Corporation. Pivotable inking device with guard means for code dating apparatus. 3,745,920, Cl. 101-329.000.

McKendry, John K.: *See—*
Gamertsfelder, George R.; Goldfischer, Lester I.; McKendry, John K.; and Vesper, Richard M., 3,747,103.

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McLean, Michael B.: *See—*
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McNaught, John P., to Lever Brothers Company. Margarine. 3,746,551, Cl. 99-122.00r.

Medovar, Boris Iarailevich: *See—*
Paton, Boris Evgenievich; Medovar, Boris Iarailevich; Latash, Jury Vadimovich; and Bagloi, Vitaly Mikhailovich, 3,746,075.
Medspecs, Inc.: *See—*
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Medynski, Joseph. Sewing machine. 3,745,949, Cl. 112-152.000.
Meginnis, Charles E. Sight glass assembly. 3,746,431, Cl. 350-319.000.
Meguro, Kanji: *See—*
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 3,746,701.
Mehmedbasich, Enver, to Chevron Research Company. Di(hydrocarbon substituted)polyamine fuel detergents. 3,746,520, Cl. 44-58.000.
Mehta, Minoo Dossabhoy; and Bainbridge, John Graham, to Beecham Group Limited. 2-(Ethylpropylamino)ethyl-α~α-diphenylglycollate and the hydrochloride thereof. 3,746,743, Cl. 260-473.00a.
Meiners, Elmo R., to M & W Gear Company, Inc. Auger exhaust construction for forced air grain dryer. 3,745,669, Cl. 34-187.000.
Meise, Henry August, Jr.; and Taylor, George William, to Bell Telephone Laboratories, Incorporated. Telephone switching system scanning and identification arrangement. 3,746,797, Cl. 179-18.00d.
Meisels, Alex; and Schott, Emilio, to Ciba-Geigy Corporation. 2,4-Thiazolidinedione-2-thiosemicarbazones. 3,746,717, Cl. 260-306.700.
Melconian, Jerry O., to Avco Corporation. Variable geometry for controlling the flow of air to a combustor. 3,745,766, Cl. 60-39.230.
Mendelson, Emanuel S.: *See—*
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Merck & Co., Inc.: *See—*
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Merck, E., A.G.: *See—*
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Mertz, Dale H.; Loeb, Alfred A.; and Falkowski, Edmund W., to United States of America, Army. Sabot spin-stabilized projectile. 3,745,926, Cl. 102-93.000.
Messenger, Edward J., to Garlock, Inc. Apparatus for removably holding mold cavity sections to mold plates. 3,746,488, Cl. 425-195.000.
Messner, Rudolf: *See—*
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Metaframe Corporation: *See—*
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Mettler, Lovena G.: *See—*
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Metz, Josef; and Zielinski, Erich, to Rheinmetall G.m.b.H. Hydropneumatic recuperator for pieces of ordnance. 3,745,880, Cl. 89-43.00r.
Meyer, Engelbert A., to USM Corporation. Structural assembly and deformable clip. 3,746,378, Cl. 287-189.36r.
Meyer, Harry C., III: *See—*
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Meyer, Robert J.; Johnson, Carl E.; and Crouthamel, Carl E., to United States of America, Atomic Energy Commission. Method for detecting and locating failed sodium-bonded fuel elements. 3,746,614, Cl. 176-19.01d.
Meyer, Ronald A.: *See—*
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Michaud, Andre Louis, to Fabriques de Produits Chimiques de Thann et de Mulhouse. Sole plate for fluidized bed reactor. 3,746,516, Cl. 23-291.000.
Mikus, Felix F.: *See—*
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Milam, Robert A. Radiating cone antenna. 3,747,116, Cl. 343-837.000.
Miles Laboratories, Inc.: *See—*
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Miller, Arthur F.; Shaw, Wilfrid G.; and Blythe, Hugh M., to Standard Oil Company, The. Catalyst manufacturing process. 3,746,657, Cl. 252-437.000.
Miller, J. H., Jr.: *See—*
Fair, Delbert W.; and Miller, J. H., Jr., 3,745,885.
Miller, James S.: *See—*
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Miller, John R.: *See—*
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Minagawa, Kenichiro: *See—*
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Minera, Salvador A. Clamping device including lateral adjustment means thereon. 3,745,638, Cl. 29-271.000.
Minnesota Mining and Manufacturing Company: *See—*
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Crain, George W., 3,746,053.
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Tait, William C.; Campbell, Donald A.; Packard, James R.; and Dierssen, Gunther H., 3,747,018.
Minutillo, Leonard D., to Griffiths Electronics, Inc. Method and apparatus for forming a multiple sectioned ring. 3,746,828, Cl. 219-86.000.
Misawa, Matsushi; Kato, Isao; and Fujiwara, Yasutake, to Kabushiki Kaisha Kohka. Cine-camera with simultaneous optical sound-recording device. 3,746,438, Cl. 352-166.000.
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Misjulin, Alexandr Vasilievich: *See—*
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Mitani Valve Company, Limited: *See—*
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Mitchell, John H. Cable grip grapple. 3,746,385, Cl. 294-112.000.
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Mitsubishi Chemical Industries, Limited: *See—*
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Mitsuyasu, Tetsuo; and Tsuji, Jiro, to Toray Industries, Inc. Method for producing carboxylic acid unsaturated esters. 3,746,749, Cl. 260-497.00r.
Miyagawa, Umihiro: *See—*
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Miyakawa, Seinan; Noda, Nobuhiro; and Shimoda, Mitsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrically controlled photographic camera shutter apparatus. 3,745,901, Cl. 95-53.0eb.
Miyamoto, Mikio, to Nippon Piston Ring Co., Ltd. Spacer expander and process therefor. 3,745,627, Cl. 29-156.600.
Miyano, Shizuo: *See—*
Kondo, Asaji; Kitajima, Masao; and Miyano, Shizuo, 3,746,621.
Miyashita, Tsuneo; and Fukushima, Tsutomu, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for heating combustible gas. 3,746,503, Cl. 432-30.000.
Miyata, Akira; Okubo, Hideyo; and Tomita, Chikayoshi, to Nippon Kokan Kabushiki Kaisha. Apparatus for electroplating workpieces including means to vary the position of the workpieces. 3,746,633, Cl. 204-231.000.
Miyazako, Takushi: *See—*
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Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., to United States of America, Agriculture. Hexachlorocylcopentadiene adducts of unsaturated amides. 3,746,722, Cl. 260-326.50e.
Moeller & Neumann G.m.b.H.: *See—*
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Mohelnicky, Josef; Zmailik, Josef; and Lisa, Miloslav, to Statni Vyzkumny ustav textilni. Machine for making a partly woven and partly knitted fabric. 3,746,051, Cl. 139-11.000.
Mohr, Gunther; Erdmann, Dietrich; Niethammer, Konrad; and Schneider, Gerhart, to Merck, E., A.G. Esters of 9-fluorene carboxylic acid and derivatives thereof. 3,746,740, Cl. 260-469.000.
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Monahan, Gerald L.: *See—*
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Monahan, Victor C.; Monahan, Gerald L.; and Cundy, Clyde Y., to Cascade Pole Company. Resin coated wooden poles and light standards incorporating same. 3,746,776, Cl. 174-45.00r.

Monroe X-Ray Company, Inc.: *See—*
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Moore, Glen F.: *See—*
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Moore, Jimmy J.; and Ward, Allen C. Diver decompression apparatus. 3,746,850, Cl. 235-184.000.

Moore, Paul, Company Limited, The: *See—*
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Moore, Robert D., Sr., to United States Gypsum Company. Double-revolving disc refiner. 3,746,270, Cl. 241-251.000.

Moore, William H.; and Kessler, Harry H. Gating system for introducing additives to molten metal. 3,746,078, Cl. 164-363.000.

Moorhead, Seth B., Jr.: *See—*
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Moran, James G. Inflatable and illuminable figure. 3,745,677, Cl. 40-126.00b.

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Morgan, David W., to Corning Glass Works. Chemically resistant aluminophosphate glasses. 3,746,556, Cl. 106-47.00r.

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Mori, Hirokazu: *See—*
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Morimoto, Ikohisa; Fujimoto, Hiroaki; Yamada, Kiyoshi; and Hisano, Kowashi, to Matsushita Electric Works, Ltd. Electromagnetic relay. 3,747,035, Cl. 335-106.000.

Morley, Edwin R., to AMF Incorporated. Synchronous motor with improved starting characteristics. 3,746,900, Cl. 310-41.000.

Morris, Joseph P.: *See—*
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Morrison, Joseph N., Jr., to Dravo Corporation. Pollution control system for discharging operations of coke oven. 3,746,626, Cl. 202-263.000.

Morrison, Robert B., to Sheldon, E. H., and Company. Unit package dispenser. 3,746,213, Cl. 221-303.000.

Mortimer, Charles P. L., to Singer Company, The, mesne. Automatic monitoring procedural items in a training device. 3,745,671, Cl. 35-12.00r.

Moser, Hermann, to Kalle Aktiengesellschaft. Bucket unit. 3,746,145, Cl. 198-140.000.

Moss, Norman: *See—*
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Motes, Bill G.: *See—*
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Huffman, Ralph Richard; and Smith, Siegfred Alexander, 3,745,969.
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Normington, Peter J. C., 3,746,945.

Mott, James D., 1/3 to Breston, Michael P. Subsurface blowout prevention. 3,746,097, Cl. 166-315.000.

Mottl, George: *See—*
MacDonald, Stanley W.; and Mottl, George, 3,745,921.

Mount Hope Machinery Company: *See—*
Knapp, George P.; and Staples, Robert E., 3,746,129.

Moussoulos, Lucas Sofoclis. Process of producing ferro-nickel in a rotary furnace including pelletizing and pre-reducing ore. 3,746,533, Cl. 75-3.000.

Moyer, Ross; and Karandy, Fred, to Carrier Corporation. Method for attaching solder rings to work pieces. 3,745,644, Cl. 29-515.000.

MPB Corporation: *See—*
Wachter, Vincent C.; Keller, Joseph R.; and Fellman, Frederick J., 3,746,408.

Mueller Co.: *See—*
Leopold, Wilbur R.; and Smith, John J., 3,746,371.

Muhler, Joseph C., to Indiana University Foundation. Process for producing a dental cement and product produced thereby. 3,746,555, Cl. 106-35.000.

Mullins, Albert A., to Schlumberger Technology Corporation. Releasable locking system for a well tool. 3,746,093, Cl. 166-217.000.

Multescreen N.V.: *See—*
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Munsingwear, Inc.: *See—*
Cuozzi, Concetta L., 3,746,009.

Muranaka, Tsutomu, to Omron Tateisi Electronics Co. Instrument mounting assembly with timer camming arrangement. 3,746,931, Cl. 317-99.000.

Murata, Keiichi, to Kabushiki Kaisha. Automatic openable unbrella. 3,746,025, Cl. 135-22.000.

Murphy, Frank W., Manufacturer, Inc.: *See—*
Sparks, Buddy G., 3,746,926.

Murphy, John V. Motorized ski towing unit. 3,745,962, Cl. 115-6.100.

Murray, Charles Robertson, to Canadian Industries Limited. Valve bag. 3,746,246, Cl. 229-62.500.

Murre, Robert W.; and Schulz, Herman C., to Bell & Howell Company. Severing mechanism. 3,745,863, Cl. 83-224.000.

Myers, Claude K.; and Myers, Gary A. High visosity dissolver. 3,746,267, Cl. 241-46.110.

Myers, Gary A.: *See—*
Myers, Claude K.; and Myers, Gary A., 3,746,267.

Mylee Digital Sciences, Inc.: *See—*
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Myles, Asa H.; and Erb, Fred, to Square D Company. Adjustable voltage thyristor-controlled hoist control for a DC motor. 3,746,954, Cl. 318-247.000.

Nagai, Tomomasu, to Kyoraku Kogyo Co., Ltd. Hollow double-wall article. 3,746,204, Cl. 220-9.00r.

Nagasaka, Moritoshi: *See—*
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Nagasaki, Yoichi, to Nippon Gakki Seizo Kabushiki Kaisha. Heel-holding device for safety ski bindings. 3,746,354, Cl. 280-11.35t.

Nagata, Senichi: *See—*
Suda, Toshi; and Nagata, Senichi, 3,745,982.

Nagy, Emery J., to Kwikee Enterprises, Inc. Suspension means for bunk beds. 3,745,595, Cl. 5-9.000.

Nakajima, Hitoshi; and Chono, Masazumi. Process for the production of alkylene sulfide. 3,746,723, Cl. 260-327.00e.

Nakajima, Takeji: *See—*
Takeda, Mutsuo; Nakajima, Takeji; Takahata, Kenji; and Banba, Toshitsugu, 3,746,584.

Nakayama, Masayuki, to Sony Corporation. Video signal phase regulating system. 3,746,781, Cl. 178-6.6tc.

Nakazaki, Kenichi, to Tokyo Shibaura Electric Co., Ltd. Electric pencil sharpener. 3,746,061, Cl. 144-28.500.

Nakazato, Susumu, to Continental Oil Company, mesne. Nuclear reactor fuel element spacer assembly. 3,746,618, Cl. 176-78.000.

Nalco Chemical Company: *See—*
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Nanamatsu, Satoshi; Kimura, Masakazu; and Doi, Kikuo, to Nippon Electric Company. Strontium niovate electro-optic modulator. 3,747,022, Cl. 332-7.510.

Naraoka, Kiyotake; Sano, Hisumi; and Itoh, Yokichi, to Hitachi, Ltd. Contact members for silicon semiconductor devices. 3,746,944, Cl. 317-234.00r.

Narayan, T. V. Lakshmi; and Cenker, Moses, to BASF Wyandotte Corporation. Polyisocyanates blocked with polyhaloalcohols. 3,746,689, Cl. 260-77.5tb.

Nathanson, Harvey C.; and Davis, John R., Jr., to Westinghouse Electric Corporation. Electrostatically deflectable light valves for projection displays. 3,746,911, Cl. 315-21.00r.

National Cash Register Company, The: *See—*
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Nauta, Constant Johan, to Nautamix Patent A.G. Apparatus for treating substances. 3,746,314, Cl. 259-21.000.

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Nauta, Constant Johan, 3,746,314.
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Neal, Gerald Wayne; and Booth, Llewellyn Delphin, to Dow Chemical Company, The. Water absorbable rigid urethane foam compositions. 3,746,666, Cl. 260-2.5ad.
Nebolsine, Ross; and San Roman, Guillermo. Selective multi-stage filtration system. 3,746,172, Cl. 210-253.000.
Nebout, Noel, to Dunlop Limited. Manufacture of pneumatic tyres. 3,746,598, Cl. 156-400.000.
Necchi S.p.A.: *See—*
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Neff, Charles G.; and Beebe, William F., to Holland Hitch Company. Truck tractor converter dolly. 3,746,369, Cl. 280-476.00r.
Neil, Peter C., to Standard Oil Company. Apparatus for making articles of manufacture from a thin film of plastic. 3,746,497, Cl. 425-378.000.
Neill, Jimmie: *See—*
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Nelson, Arthur John. Control of towed barges. 3,745,958, Cl. 114-236.000.
Nelson, Tom Worsley: *See—*
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Nerwin, Hubert, to Eastman Kodak Company. Film assemblage. 3,745,900, Cl. 95-19.000.
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Newman, Robert D. Extensible paint roller frame. 3,745,624, Cl. 29-116.00r.
Neyhart, Floyd B.; and Styron, James S., to Carrier Corporation. Sludge separation systems employing refrigeration means. 3,745,782, Cl. 62-159.000.
Nibco, Inc.: *See—*
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Nienhuis, Rijkent Jan; and Van den Hurk, Theodorus Hubertus Josephus, to U.S. Philips Corporation. Semiconductor device. 3,746,949, Cl. 317-235.00r.
Nies, Harry B. Human motor coordination measuring apparatus. 3,745,990, Cl. 128-2.00s.
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Niizuma, Fujio: *See—*
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Niklas, Ludwig. Ultrasound pulse echo method and apparatus for determining acoustic velocity of materials. 3,746,121, Cl. 181-.5ap.
Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Preparative approach to 7-lower alkanoyl benzodiazepines. 3,746,702, Cl. 260-239.0bd.
Nippon Electric Company: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Oils and Fats Company Limited: *See—*
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Nippon Piston Ring Co., Ltd.: *See—*
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Nishikata, Ryoji; and Fujieda, Toshio, to Nippon Kokan Kabushiki Kaisha. Method of preventing corrosion of the bottom of blast furnace immersed in cooling water. 3,746,629, Cl. 204-148.000.
Nishikawa, A. Hirotoshi; and Hixson, Harry F., Jr., to Xerox Corporation. Composition and process. 3,746,622, Cl. 195-66.00r.
Nishikawa, Hideo, to Wada Seiko Kabushiki Kaisha. Rotation preventive device. 3,746,413, Cl. 308-236.000.
Nishikawa, Satoru: *See—*
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Nishinomiya, Makoto: *See—*
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Nolan, James F.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,746,420.
Nolte, Claude B., to Kingmann-White, Inc. Apparatus for integrating and recording quantity of flow of fluid. 3,745,825, Cl. 73-206.000.
Nomoto, Yoshihisa; Oguino, Masanori; Ueda, Seiichi; and Kitamora, Sadao, to Hitachi, Ltd. Noise detecting circuit for television receivers and the like. 3,746,786, Cl. 178-7.30s.
Nordmann, Joseph; Mattioda, Georges Dominique; and Loiseau, Gerrard Paul Marie Henri, to Kuhlmann, Vojine. Medicament with hypoglycemic properties and process for its preparation. 3,746,764, Cl. 260-564.00f.
Nordson Corporation: *See—*
Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., 3,746,254.
Nordstrom, John D., to Ford Motor Company. Siloxane-unsaturated ester coated product. 3,746,567, Cl. 117-93.310.
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Normington, Peter J. C., to Motorola, Inc. Schottky diode clipper device. 3,746,945, Cl. 317-235.00r.
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North American Rockwell Corporation: *See—*
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Norton, Charles J.; and Falk, David O., to Marathon Oil Company. Polyalkeneoxide and polysaccharide gum derivatives mobility control agent and process. 3,746,094, Cl. 166-275.000.
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Novak, Leo J., to Rand Laboratories, Inc. Device for the collection of urine. 3,745,592, Cl. 4-99.000.
Novak, Warren D. Hassock. 3,746,391, Cl. 297-193.000.
Novak, Warren D. Multi-character selective display device. 3,747,091, Cl. 340-378.00b.
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Nukem Nuklear-Chemie und Metallurgie, G.m.b.H.: *See—*
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Nussbaumer, Henri J.: *See—*
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Nysten, Bernhard, to William Prym-Werke K.G., Firma. Device for the connection of snap fastener closure halves over a securing ring having bendable prongs on a carrier. 3,746,237, Cl. 227-147.000.
Nystrand, Ernst Daniel; and McIntosh, Brian H., to Paper Converting Machine Company. Method of producing sanitary napkins. 3,746,592, Cl. 156-202.000.
Nystrom, Kjell Signar; and Larsson, Gosta Ingemar, to Pitea Maskin-Industri, Nystrom & Larsson AB. Wood chipper or the like. 3,746,062, Cl. 144-176.000.
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Obayashi, Mikihiko: *See—*
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Oberreich, Rudolf. Device for fastening decorative rods to upright rods of metal railings. 3,745,615, Cl. 24-243.00b.

Ochs, Charles S.; and Probascs, Charles W., to Anchor Hocking Corporation. Damaged cap ejector. 3,746,163, Cl. 209-73.000.

O'Connor, Joseph, Jr. Control valve. 3,746,049, Cl. 137-802.000.

O'Connor, Kevney J.: *See—*
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OCR Systems, Inc.: *See—*
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Oehlschlaeger, Herman F.: *See—*
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Offshore Company, The: *See—*
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Offshore Recovery System, Inc.: *See—*
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Ofstead, Eilert A., to Goodyear Tire & Rubber Company, The. Interpolymers of polycyclic polyunsaturated hydrocarbons and cyclic olefins. 3,746,695, Cl. 260-88.20d.

Ogawa, Kohei. Flower holding base for flower arrangement. 3,745,702, Cl. 47-41.130.

Ogi, Mikio; and Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with built-in tape recorder. 3,746,772, Cl. 84-1.020.

Ogirima, Masahiko: *See—*
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Ogiso, Mitsutoshi; and Taguchi, Tetsuka. Output voltage regulation system. 3,746,892, Cl. 307-297.000.

Ogland, Jon W.; and Malarkey, Edward C., to Westinghouse Electric Corporation. Resolution improvement for optical scanners. 3,746,840, Cl. 235-61.11e.

Oglesbee, Richard K., to Anchor Hocking Corporation. Carton lock. 3,746,245, Cl. 229-40.00r.

Oguino, Masanori: *See—*
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Oguro, Tomokatsu, to Hitachi, Ltd. Magnetrons. 3,746,916, Cl. 315-39.510.

O'Hara, Mark J., to Universal Oil Products Company. Method of preparing a catalyst for the hydrorefining of residual oils. 3,746,660, Cl. 252-455.00r.

O'Hara, Mark J., to Universal Oil Products Company. Method of preparing a catalyst for the hydrorefining of residual oils. 3,746,661, Cl. 252-455.00r.

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Ohata, Shuichi; Kamino, Tadashi; Takeuchi, Yoji; and Ishiguro, Takeshi, to Yokogawa Electric Works, Ltd. Apparatus using X-rays for measuring the content of an element having a higher mass absorption coefficient than hydrogen and carbon in hydrocarbon compunds. 3,746,874, Cl. 250-358.000.

Ohm, Edward Allen, to Bell Telephone Laboratories, Incorporated. Differential attenuator having a zero net differential phase-shift. 3,747,031, Cl. 333-81.00b.

Ohmatsu, Hideki; and Ueda, Hirozo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive materials for color printed showing excellent color reproduction. 3,746,539, Cl. 96-68.000.

Ojima, Masaki; and Arata, Masahiro, to Kawasaki Jukogyo Kabushiki Kaisha. Slag screen for refining furnace. 3,746,324, Cl. 266-1.00r.

Okada, Toshiyuki; and Nagasaka, Moritoshi, to Osaka Transformer Co., Ltd. Direct current arc welder. 3,746,965, Cl. 321-5.000.

Okamoto, Shinsuke; Unoue, Hiromitsu; Ohasi, Hirosi; Mori, Hirokazu; and Kawaguchi, Shojiro, to Matsushita Electric Works, Ltd. Ultrasonic detection apparatus. 3,747,058, Cl. 340-16.00r.

O'Keefe, John Gail: *See—*
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Okubo, Hideyo: *See—*
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Okuda, Kensuke: *See—*
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Olesen, Finn; and Benz, Konrad, to Zellweger AG. Apparatus for high-frequency mixing. 3,747,096, Cl. 343-8.000.

Olin Corporation: *See—*
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Olivetti, Ing., C., & C., S.p.A.: *See—*
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Olsen, Alden W.: *See—*
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Olson, Albert W.; Gungle, Warren Calvin; and Waymouth, John F., to GTE Sylvania Incorporated. Arc discharge tube with surrounding starting coil. 3,746,914, Cl. 315-47.000.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Rigid polyurethane compositions. 3,746,692, Cl. 260-77.5ma.

Omega Louis Brandt et Freres, S.A.: *See—*
Hetzel, Max, 3,745,843.

Omoto, Katsuji. Device for measurement of a visual field of two eyes. 3,746,433, Cl. 351-24.000.

Omron Tateisi Electronics Co.: *See—*
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Ono, Yoshiako: *See—*
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Ontario Research Foundation: *See—*
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Orain, Michel, to Societe Anonyme: Glaenzer Spicer. Axially fixed homokinetic coupling with limited transverse freedom of movement. 3,745,789, Cl. 64-21.000.

Organovsky, Naum Abramovich: *See—*
Rogachev, Boris Vasilievich; Organovsky, Naum Abramovich; Sedelnikov, Ertel Sergeevich; and Charsky, Mikhail Mikhailovich, 3,746,978.

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Oshihozawa, Akiyasu: *See—*
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Ostbo, John David Bertil. Heat-exchanger comprising a plurality of helically wound pipe elements. 3,746,084, Cl. 165-163.000.

Oswald, Fred. Grinding wheel for floor grinding machine. 3,745,719, Cl. 51-209.00r.

Ottenstein, Sidney Allan, to M&J Valve Company. Systems with constant current generators for transmitting flow rate data. 3,747,082, Cl. 340-205.000.

Outboard Marine Corporation: *See—*
Du Bois, Chester G.; and Hunt, Paul R., 3,746,036.
Henrich, Donald A., 3,745,964.

Outokumpu Oy: *See—*
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Owatonna Tool Company: *See—*
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Owen, Harrold D.; Rosenthal, Wayne O.; and Young, James Douglas. Conduit liner for wellbore. 3,746,091, Cl. 166-107.000.

Owens, J. C.: *See—*
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Owens-Corning Fiberglas Corporation: *See—*
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Owens-Illinois, Inc.: *See—*
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,746,420.
Rybarczyk, Frederick, 3,746,568.

Oxenrider, Bryce C.; Woolf, Cyril; and Beyleveld, Wilhelmus M., to Allied Chemical Corporation. Electrical apparatus comprising perfluoroazaolefin as liquid dielectric. 3,746,952, Cl. 317-258.000.

Oy Nokia AB: *See—*
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Oy Tampella AB: *See—*
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Ozu, Masao; and Mori, Shinsaku, to Tokyo Shibaura Electric Co., Ltd. Rotary compressor. 3,746,477, Cl. 417-372.000.

P & O Pilgrim Valve Limited: *See—*
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Pace, Frank P.; Lange, Ronald A.; and Arams, Frank R., to United States of America, Navy. Infrared receiver for optical radar. 3,746,454, Cl. 356-152.000.

Pacific Scientific Company: *See—*
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Packard, James R.: *See—*
Tait, William C.; Campbell, Donald A.; Packard, James R.; and Dierssen, Gunther H., 3,747,018.

Pagano, Angelo S., to Rohm & Haas Company. Method of preparing organic isocyanates. 3,746,746, Cl. 260-478.000.

Palazzolo, Thomas P. Pyramid type amusement and educational device. 3,746,345, Cl. 273-155.000.

Palmer, George W.: *See—*
Herpich, William A.; Chaney, Donal W.; and Palmer, George W., 3,746,192.

Pamark, Inc.: *See—*
Troth, John S., 3,746,242.

Pammer, Erich; and Folkmann, Eduard, to Siemens Aktiengesellschaft. Silicon nitride coating on quartz walls for diffusion and oxidation reactors. 3,746,569, Cl. 117-97.000.

Pammer, Gottfried; and Notdurfter, Josef, to Vockenhuber, Karl and Hauser, Raimund. Arrangement for use in projection. 3,746,437, Cl. 352-104.000.

Pansini, Anthony J., 50% to Long Island Lighting Company. Supervisory system for detection and location of contingencies. 3,747,104, Cl. 343-112.00r.

Paolini, Laurent L. Method and apparatus for joining two elements made of metal or thermoplastic material. 3,745,641, Cl. 29-479.300.

Paper Converting Machine Company: *See—*
Nystrand, Ernst Daniel; and McIntosh, Brian H., 3,746,592.

Paper Machinery Corporation: *See—*
Bodendoerfer, Raymond E., 3,745,891.

Paramount Glass Mfg. Co., Ltd.: *See—*
Kasuga, Kesaharu; Abe, Takeo; and Haga, Tsunehiro, 3,746,525.

Paraskos, John A.; and Somers, Allen E., to Gulf Research & Development Company. Desulfurization of crude and residual oils at constant temperature. 3,746,636, Cl. 208-216.000.
Parcher, Michael S., to United States of America, Navy. Antenna alignment device. 3,747,110, Cl. 343-705.000.
Parisi, Franco; Faustini, Franco; and Canavesi, Lavinio, to Erba, Carlo, S.p.A. Dibasic aluminum histidinate. 3,746,700, Cl. 260-299.000.
Park Manufacturing Company: *See*—
Evans, Jack, 3,746,210.
Park-Ohio Industries, Inc.: *See*—
Pfaffmann, George D., 3,746,825.
Parker, Marshall M.: *See*—
Harrison, Lee, III; Honey, Francis J.; Tauchman, Edwin J.; and Parker, Marshall M., 3,747,087.
Parker Pen Company, mesne, The: *See*—
Hill, Franklin J., 3,746,456.
Parker, Winfred E.: *See*—
Magne, Frank C.; Mod, Robert R.; Sumrell, Gene; and Parker, Winfred E., 3,746,644.
Parker-Hannifin Corporation: *See*—
Paul, John C., 3,746,040.
Simmons, Harold C., 3,746,038.
Stone, John G., 3,746,348.
Parks, Christ F.: *See*—
Eilers, Louis H.; and Parks, Christ F., 3,746,725.
Parrish, Donald B.: *See*—
Olstowski, Franciszek; and Parrish, Donald B., 3,746,692.
Parsons, David; and Bailey, Walter William, to Automotive Products Company Limited. Pressure operated electric switches with flexible helical bridging contact. 3,746,810, Cl. 200-81.00r.
Parsons, Timothy F., to Eastman Kodak Company. Photographic diffusion transfer product and process. 3,746,564, Cl. 117-68.000.
Pask, George; and Robinson, Norman Robert, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Method of determining optimal shapes for stator blades. 3,745,629, Cl. 29-156.8b.
Passeri, David P.: *See*—
Willett, Richard M.; and Passeri, David P., 3,746,997.
Pasternak, Stephen F., to Peerless of America, Incorporated. Heat exchangers. 3,746,086, Cl. 165-181.000.
Pastoriza, James J., to Analog Devices Inc. Solid state digital-to-analog converter. 3,747,088, Cl. 340-347.0da.
Paton, Boris Evgenievich; Medovar, Boris Iarailevich; Latash, Jury Vadimovich; and Bagloi, Vitaly Mikhailovich. Electroslag system for the production of metal castings. 3,746,075, Cl. 164-252.000.
Patouillard, Gilbert, to Societe Viscora. Apparatus for shirring artificial sausage casing. 3,745,611, Cl. 17-42.000.
Patros, George C., to Kar-Denser, Inc. Scrap processing machine. 3,745,916, Cl. 100-215.000.
Patterson, Robert J.: *See*—
Henegar, Hubert B.; and Patterson, Robert J., 3,746,845.
Patton, George H.: *See*—
Fasching, George E.; and Patton, George H., 3,747,001.
Patton, John T., Jr.; Cenker, Moses; and Kan, Peter T., to BASF Wyandotte Corporation. Hexahydrotriazine adducts as co-catalysts for the preparation of foams characterized by carbodiimide foams. 3,746,709, Cl. 260-248.0ns.
Paul, John C., to Parker-Hannifin Corporation. Directional control valve. 3,746,040, Cl. 137-596.000.
Paumgardhen, Gaethy. Flexible suspended wine rack. 3,746,179, Cl. 211-75.000.
Pauwels, Willy Lodewijk: *See*—
Reeters, Emiel Adriaan; and Pauwels, Willy Lodewijk, 3,746,599.
Pavek, George E. Outboard motor lock. 3,745,797, Cl. 70-232.000.
Pavlath, Attila E.; and Slater, Richard F., to United States of America, Agriculture. Shrinkproofing of wool by low temperature plasma treatment. 3,746,858, Cl. 250-49.5gc.
Payne, Delmar V., to Bendix Corporation, The. Position determining system for helicopters. 3,747,105, Cl. 343-112.00r.
Payne, Laurence Sydney; Ward, Peter; and Wells, Reginald David, to Lever Brothers Company. Preparation of pyrazine derivatives. 3,746,711, Cl. 260-250.00r.
Peabody Galion Corporation: *See*—
Herpich, William A.; Chaney, Donal W.; and Palmer, George W., 3,746,192.
Pease, Robert A., to Teledyne, Inc. Amplitude-to-frequency converter. 3,746,968, Cl. 321-60.000.
Pease, William C., III: *See*—
Van Doorn, Donald W.; and Pease, William C., III, 3,746,465.
Peebles, Roy M. Apparatus for polishing a seaming roll. 3,745,718, Cl. 51-241.00s.
Peck, Vernon E., to Anderson Electric Corporation. Compression connector for electrical conductors with tabs in series. 3,746,777, Cl. 174-94.00r.
Peerless of America, Incorporated: *See*—
Pasternak, Stephen F., 3,746,086.
Pehle, Frank; and Winter, Michael, to Winter, Jack, Inc. Article of clothing and method of making same. 3,745,588, Cl. 2-221.000.
Pehoqnin, Leo, to Gillette Company, The. Making soap bars. 3,746,647, Cl. 252-91.000.
Pekar, Frank J., Jr.; and Eisenberg, Eugene, to Mack Trucks Inc. Cylinder sleeve system for high output engine. 3,745,980, Cl. 123-41.740.
Penland, Allice M. Ruffle former. 3,746,219, Cl. 223-35.000.
Pennington, William: *See*—
Yu, Ying-Nien; and Pennington, William, 3,746,835.
Pennwalt Corporation: *See*—
Sheppard, Chester Stephen; and Korczykowski, Leonard Earnest, 3,746,760.
Pennypacker, Frank C., to Lindsay Specialty Products Limited. Directional tap comprising pi-section high pass filter for use in CATV system. 3,747,028, Cl. 333-10.000.
Peoples, John Terrance, to Bell Telephone Laboratories, Incorporated. Asynchronous single-sideband demodulation. 3,746,996, Cl. 325-330.000.
Peoples, Lawrence, to Dow Chemical Company, The. Stabilizer composition. 3,746,648, Cl. 252-171.000.
Pepe, Enrico J.; and Marsden, James G., to Union Carbide Corporation. Silicon containing polyazamides. 3,746,738, Cl. 260-46.50e.
Peppel, Howard C.: *See*—
Drown, John L.; and Peppel, Howard C., 3,746,817.
Peppiatt, Harry J.: *See*—
Hall, James A.; and Peppiatt, Harry J., 3,747,032.
Perina, Joseph, to American Velcro, Inc. Pull-out window frame. 3,745,709, Cl. 49-465.000.
Perlman, Morris, to Carbide Form Grinding, Inc. Bottom stop machine. 3,746,236, Cl. 227-88.000.
Perrin, Georges: *See*—
Caillat, Maurice; and Perrin, Georges, 3,745,784.
Perron, Robert R., to Eastern Company, The, mesne. Combined digital display speedometer and log. 3,746,985, Cl. 324-166.000.
Perronnet, Jacques: *See*—
Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, 3,746,529.
Perry, Eli; and Strazik, Wihhii F., to Monsanto Company. Process for the separation of diene from organic mixtures. 3,745,744, Cl. 55-16.000.
Perry, Francis J.; and Schacht, Guenther H., to International Business Machines Corporation. Wide base type carrier. 3,745,918, Cl. 101-111.000.
Pester, William B.: *See*—
Carabet, George F.; Holland, Andrew M.; Morris, Joseph P.; Pester, William B.; and Pinkerton, Kennteh R., 3,746,439.
Peters, Clifford M. High or low pressure cutoff control valve. 3,746,047, Cl. 137-625.660.
Peters, David L., to Singer Company, The. Limited visibility simulation for a vehicle trainer visual system. 3,746,778, Cl. 178-5.20r.
Peterson, Glen, to Stoplifter International, Inc., mesne. Deactivatable ferromagnetic marker for detection of objects having marker secured thereto and method and system of using same. 3,747,086, Cl. 340-280.000.
Peterson, Terry J.: *See*—
Carter, David P.; and Peterson, Terry J., 3,747,047.
Petrie, Patrick. Watchband calendar and business card holder. 3,745,679, Cl. 40-107.000.
Petrov, Gueorgui Mitov, to BTR "Pamukotex". Method of and tension-regulating device for tight-twisting of threads. 3,745,764, Cl. 57-59.000.
Pett, Roger H.: *See*—
Lettieri, John; and Pett, Roger H., 3,746,839.
Petzold, Jurgen, to Volkswagenwerk Aktiengesellschaft. Process for controlling spot welding and non-destructive testing of spot-welded joints. 3,746,829, Cl. 219-110.000.
Pews, R. Garth; and Rodia, Ralph M., to Dow Chemical Company, The. Carbamate esters of dichloro-nitro-alkoxy- and dichloro-nitro-hydroxyalkoxy-phenols. 3,746,739, Cl. 260-468.00e.
Pfaender, Lawrence V.: *See*—
Baker, Theodore C.; Bode, Wolfgang W.; Mathias, Richard G.; Nolan, James F.; and Pfaender, Lawrence V., 3,746,420.
Pfaffmann, George D., to Park-Ohio Industries, Inc. System and method for measuring input energy for an induction heating installation. 3,746,825, Cl. 219-10.770.
Phelan, Robert J.; and Dimmock, John D., to Massachusetts Institute of Technology. Radiation responsive signal storage device. 3,746,867, Cl. 250-209.000.
Philco-Ford Corporation: *See*—
Aber, Leon J., 3,746,910.
Philipp, Rainer: *See*—
Heinemann, Otto; Schefer, Manfred; Schossler, Werner; and Philipp, Rainer, 3,745,667.
Philippaerts, Herman Adelbert: *See*—
Pollet, Robert Joseph; Willems, Jozef Frans; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,746,545.
Phillips, Bernard C.: *See*—
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Phillips Petroleum Company: *See*—
Cines, Martin R., 3,746,754.
De Shazo, Earl L., Jr., 3,747,060.
Kuper, Donald G.; and Hughes, William B., 3,746,747.
Kuper, Donald G., 3,746,752.
Phonics Corporation: *See*—
Sachs, Reynold M.; Boutin, Henri P.; and Cicchiello, Frank, 3,746,793.
Picker Corporation: *See*—
Lombardo, Daniel F.; and Splain, Walter E., 3,746,862.
Pieddeloup, Georges. Multi-digit dial lock. 3,745,798, Cl. 70-306.000.
Pierce, Aaron E.; Burns, William A., Jr.; Cooke, Claude E., Jr.; Hillestad, Jerry G.; and Spillette, Arthur G., to Esso Production Research Company. Apparatus for determining temperature distribution around a well. 3,745,822, Cl. 73-154.000.
Pierres Holding S.A.: *See*—

Stemme, Reimer, 3,746,183.

Pilgram, Kurt H. G.: *See—*
Kollmeyer, Willy D.; and Pilgram, Kurt H. G., 3,746,704.

Pilgram, Kurt H. G.; and Skiles, Richard D., to Shell Oil Company. Benzenesulfhydroxamic acids and their derivatives. 3,746,727, Cl. 260-397.700.

Pines, Seemon H.: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,746,753.

Pinkerton, Kennteh R.: *See—*
Carabet, George F.; Holland, Andrew M.; Morris, Joseph P.; Pester, William B.; and Pinkerton, Kennteh R., 3,746,439.

Pinna, Sanford. Device for locating veins in living bodies. 3,745,989, Cl. 128-2.00r.

Pirk, Hans; Ploger, Fritz; and Vietzke, Horst, to Nukem Nuklear-Chemie und Metallurgie, G.m.b.H. Apparatus for the homogenization and mixing of nuclear fuels. 3,746,312, Cl. 259-3.000.

Pisanchyn, John: *See—*
Fuhrmann, Robert; and Pisanchyn, John, 3,746,763.

Pitea Maskin-Industri, Nystrom & Larsson AB: *See—*
Nystrom, Kjell Signar; and Larsson, Gosta Ingemar, 3,746,062.

Pittman, Clarence E.: *See—*
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Martin, Roy A.; and Pittman, Clarence E., 3,746,249.

Plastofilm Industries, Inc.: *See—*
Seeley, Leonard, 3,746,155.

Plessey Handel und Investments A.G.: *See—*
Broad, Michael John; and Moss, Norman, 3,746,257.

Plkush, Raymond J., to Zenith Radio Corporation. Sealing land cleaning machine. 3,746,020, Cl. 134-79.000.

Plocki, Johann, to Zellweger AG. Correction apparatus for optical reading mechanism. 3,746,868, Cl. 250-219.00q.

Ploger, Fritz: *See—*
Pirk, Hans; Ploger, Fritz; and Vietzke, Horst, 3,746,312.

Pneu-Dart, Inc.: *See—*
Waldeisen, Robert B., 3,745,682.

Poirier, Jean R., to Medspecs, Inc. Speculum. 3,745,992, Cl. 128-17.000.

Polaroid Corporation: *See—*
Bachelder, Albert J.; and Binda, Frederick J., 3,746,594.
Bing, Herbert A.; Brayton, Christopher; and Rubinstein, Leon, 3,745,904.
Brandt, Edison R.; and Skurski, James K., 3,745,895.
Fitzgerald, Maurice J.; and Taylor, Lloyd D., 3,746,548.

Pollet, Robert Joseph; Willems, Jozef Frans; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, to Agfa-Gevaert N.V. Development of photographic silver halide material. 3,746,545, Cl. 96-66.300.

Polysius AG: *See—*
Heinemann, Otto; Schefer, Manfred; Schossler, Werner; and Philipp, Rainer, 3,745,667.

Pont-A-Mousson S.A.: *See—*
Hauth, Jean-Marc Laurent, 3,746,133.

Ponziani, Louis F., to Chrysler Corporation. Evaporator coil refrigerant distributor. 3,745,787, Cl. 62-504.000.

Popov, Vladimir Vasilievich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.

Poppe, Dag; Mathiesen, Odd; and Holmboe, Christian Fredrik, to International Standard Electric Corporation. Frequency locking system for direction finders. 3,747,107, Cl. 343-113.00r.

Porlein, Gerhard: *See—*
Fischer, Artur; Porlein, Gerhard; and Schmidt, Erich, 3,745,736.

Port, Frederick J., to ESB Incorporated. Battery having container in two portions and a method for making it. 3,746,579, Cl. 136-134.00r.

Porta, Paolo Della; Giorgi, Tiziano A.; Kindl, Bruno; and Zucchinelli, Mario, to S.A.E.S. Getters S.p.A. Catalysts. 3,746,658, Cl. 252-439.000.

Possati, Mario, to Apparecchi Electronici Marposs. Device for changing the scale of a measuring instrument. 3,745,968, Cl. 116-129.00r.

Potter Instrument Company, Inc.: *See—*
Richwell, Gunnar; and Giouvalakis, Antonios I., 3,746,277.

Power, William A.: *See—*
Keenan, Charles E.; and Power, William A., 3,745,821.

Pozsony, Edward R.: *See—*
Madsen, Bernhardt; Pozsony, Edward R.; and Collin, Everett E., 3,745,739.

PPG Industries, Inc.: *See—*
Doerge, Herman P.; and Wismer, Marco, 3,746,664.
Dunnom, Donald D.; Wagner, Melvin P.; and Derringer, George C., 3,746,669.
Knavish, Leonard A.; Goldberg, Arnold J.; and Hilliard, William G., 3,746,527.

Pratt, Henry Company: *See—*
Fawkes, Donald G., 3,745,855.

Prentice, Thomas H. Clipper with double-action toggle mechanism. 3,745,868, Cl. 83-630.000.

Priest, Robert A.: *See—*
Swick, George W., Jr.; Priest, Robert A.; and Trimble, Jerry R., 3,746,358.

Prikhna, Alexei Iosifovich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.

Prinzhorn, Klaus, to Kabel- und Metallwerke Gutenhoffnungshutte Aktiengesellschaft. Terminal resistor for waveguides and coaxial high frequency cables. 3,747,029, Cl. 333-22.00r.

Pritchard, Harry W.; and Furman, Myron, to Superior Industries, Inc. Demountable partition system. 3,745,732, Cl. 52-239.000.

Probascs, Charles W.: *See—*
Ochs, Charles S.; and Probascs, Charles W., 3,746,163.

Process Systems, Inc.: *See—*
Friedland, Harry, 3,746,041.

Procter & Gamble Company, The: *See—*
Crawford, Robert J., 3,746,745.

Proctor, Richard I. Movable weight type exercising machine. 3,746,338, Cl. 272-81.000.

Progressive Dynamics, Inc.: *See—*
Marshall, John J.; and Dykehouse, David B., 3,746,921.

Pronovost, Jacques O., to Exotron Industries, Ltd. Light curtain control for a switch. 3,746,863, Cl. 250-208.000.

Prucha, Richard V., to General Electric Company. Microwave oven leakage radiation detecting device. 3,746,824, Cl. 219-10.550.

Prucha, Stephen J. Disposable pet relief structure. 3,745,975, Cl. 119-1.000.

Pruden, William E.: *See—*
Kannenberg, Wesley G.; and Pruden, William E., 3,746,628.

Prudente, Anthony G. Connector for electrical conduits. 3,746,373, Cl. 285-162.000.

Przygocki, Julius V.: *See—*
Zey, Aubrey F.; Przygocki, Julius V.; and Van Huffel, Phillip, 3,745,751.

Psyras, Hippocrates G.; and Bellisio, Arthur Angelo, to GAF Corporation. Dehydration process. 3,745,746, Cl. 55-31.000.

Psyras, Hippocrates G.; and Bellisio, Arthur Angelo, to GAF Corporation. Gas purification system. 3,745,747, Cl. 55-31.000.

Pullman Aktiebolag: *See—*
Kristiansson, Erik, 3,745,646.

Pumpenfabrik Urach: *See—*
Hindel, Hans; and Fries, Hugo, 3,746,483.

Pungs, Wolfgang: *See—*
Schneider, Johannes; and Pungs, Wolfgang, 3,746,565.

Purps, Heinz-Dieter, to U.S. Philips Corporation. Device for fixing electrographic power images. 3,746,834, Cl. 219-216.000.

Purtell, Rufus J. Shaft-driven automatically aligned irrigation system. 3,746,258, Cl. 239-212.000.

Pyrolyzer Incorporated: *See—*
Thompson, Stanley P.; and Boyert, David L., 3,745,942.

Quenter, Horst: *See—*
Jaegers, Heinz; and Quenter, Horst, 3,745,625.

R. F. Inc, mesne: *See—*
Hathaway, Bruce E.; Huffman, Earl W.; and O'Connor, Kevney J., 3,745,938.

Rabe, Peter: *See—*
Kluge, Johannes; Rabe, Peter; Schmidt, Otto; and Schleyer, Meinlof, 3,746,812.

Radd, Frederick T., to Continental Oil Company. Cutter bit and method of causing rotation thereof. 3,746,396, Cl. 299-10.000.

Rader, Charles A.: *See—*
Schwartz, Anthony M.; and Rader, Charles A., 3,746,767.

Raebiger, Wolfgang, to Grundig. Device for ventilating hydrostatic motion converters in free-floating piston engines. 3,745,765, Cl. 60-24.000.

Rahmig, Hermann: *See—*
Kurth, Klaus; and Rahmig, Hermann, 3,745,645.

Ralston, Philip G., Jr., to Baxter Laboratories, Inc. Pierceable access port for parenteral solution containers. 3,746,001, Cl. 128-214.00d.

Ramazzotti, Dario J.: *See—*
Rizzi, Marc A.; Hold, Peter; D'Amato, Dominic A.; and Ramazzotti, Dario J., 3,746,489.

Rammesberger, Karl: *See—*
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Ramstetter, Otto, Kommanditgesellschaft, Firma: *See—*
Ramstetter, Rudolf, 3,745,839.

Ramstetter, Rudolf, to Ramstetter, Otto, Kommanditgesellschaft, Firma. Apparatus for controlling the movement of a program carrier. 3,745,839, Cl. 74-30.000.

Ranco Incorporated: *See—*
Attridge, Russell G., Jr., 3,745,778.
Lorenz, Jerome L., 3,746,887.

Rand Laboratories, Inc.: *See—*
Novak, Leo J., 3,745,592.

Raneses, Pedro C. Apparatus for determining earthwork volumes. 3,745,658, Cl. 33-121.000.

Ranganath, Gorur Ramaswmiengar, to Standard Electric Time Corporation, mesne. Alarm circuit. 3,747,093, Cl. 340-409.000.

Rantanen, Mauri V.: *See—*
Lohikoski, Timo J. J.; Rantanen, Mauri V.; and Hocksell, Heimo H., 3,746,077.

Rapid Electroplating Process, Inc.: *See—*
Rapids, Felix R., 3,746,627.

Rapids, Felix R., to Rapid Electroplating Process, Inc. Method of metal electroplating. 3,746,627, Cl. 204-15.000.
Rapson, William H.; and Reeve, Douglas W., to Erco Envirotech Ltd., mesne. Removal of sodium chloride from white pulping liquor. 3,746,612, Cl. 162-17.000.
Rarey, Kenneth W., to Continental Can Company, Inc. Tone reproduction in screen printing. 3,746,540, Cl. 96-36.400.
Rasmussen, Ronald J., to Rheem Manufacturing Company. Time delay circuit for a motor compressor system. 3,745,781, Cl. 62-158.000.
Ratfield, Kenneth A. Portable hand tool. 3,745,806, Cl. 72-389.000.
Ratusky, Josef; and Sorm, Frantisek, to Ceskoslovenska akademie ved. Insect control agents. 3,746,748, Cl. 260-486.00r.
Rausch, Manfred, to Siemens Aktiengesellschaft. Tape drive system. 3,746,287, Cl. 242-206.000.
Ravdin, Bruce: *See—*
Rothstein, Edwin C.; and Ravdin, Bruce, 3,745,831.
Raygo, Inc.: *See—*
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Raytheon Company: *See—*
De Vellis, Salvatore V., 3,747,113.
Hoft, Donald J.; and Wallace, John B., 3,747,023.
Rosvold, Warren C., 3,746,587.
RCA Corporation: *See—*
Boleky, Edward Joseph, III, 3,745,647.
Del Rio, Eddy Humberto, 3,746,231.
Gerritsen, Hendrick; and Greenaway, David L., 3,746,783.
Keneman, Scott Allen; and Taylor, George William, 3,747,075.
Kovac, Michael George, 3,746,883.
Kressel, Henry; and Hawrylo, Frank Zygmunt, 3,747,016.
Torre, Alton John, 3,746,904.
Vaccaro, Frank Emelio, 3,747,044.
Watson, James Power, 3,747,081.
Williams, Richard Jean, 3,746,873.
Read, Norman W.; and Fisher, Ernest P., Jr., to Dresser Industries, Inc. Latch or retrievable well packer. 3,746,090, Cl. 166-134.000.
Rebsoat, Siegfried: *See—*
Schuierer, Erich; Hoffmann, Dieter; and Rebsoat, Siegfried, 3,746,742.
Recognition Systems, Inc., mesne: *See—*
Spindel, Abraham; and Maas, James F., 3,746,429.
Recycled Plastic Products Corporation: *See—*
Wagschal, Edward A., 3,746,178.
Red Rope Industries, Inc.: *See—*
Comenitz, Elliot, 3,746,457.
Reddy, Redreddy Sukumar, to Vapor Corporation. Integrated linear door operator. 3,745,705, Cl. 49-139.000.
Redecker, Friedrich; and Sommer, Ruediger, to Hell, Dr.-Ing., Rudolf. Method of and means for recording line drawings on the screen of a cathode ray tube under computer control. 3,746,912, Cl. 315-26.000.
Redman, George L. Speed changer. 3,745,845, Cl. 74-217.00s.
Reeder, Randall C.: *See—*
Diener, Robert G.; Reeder, Randall C.; and Shoemaker, Harold D., 3,746,264.
Reeder, Wilbur C.; and Batterson, Norman D. Weeper assembly and method for use in a slow diffusion type irrigation system. 3,746,263, Cl. 239-542.000.
Reeters, Emiel Adriaan; and Pauwels, Willy Lodewijk, to Gevaert-Agfa N.V. Butt splicer for butt-joining a fresh web to a running web. 3,746,599, Cl. 156-505.000.
Reeve, Douglas W.: *See—*
Rapson, William H.; and Reeve, Douglas W., 3,746,612.
Regie Nationale des Usines Renault: *See—*
Fourrey, Franscois, 3,746,389.
Rehm, Frederick George William, Jr., to Du Pont de Nemours, E. I., and Company. Process for hot baling acrylic staple. 3,745,915, Cl. 100-38.000.
Reicheneder, Franz; Dury, Karl; deceased (by Dury, Johanna Maria; heiress-at-law); Krusche, Georg; and Burger, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Brominating butyne-(2)-diol-(1,4). 3,746,726, Cl. 260-347.800.
Reid, John C., Jr., to Atlantic Richfield Company. Process for the manufacture of esters of dicarboxylic acid. 3,746,744, Cl. 260-475.00p.
Reif, Philip George: *See—*
Beeli, Johann Battesta; Brown, Roger Henry; and Reif, Philip George, 3,746,903.
Reilly, Betram B. Slagging refuse incinerators. 3,745,941, Cl. 110-8.00r.
Reinefeld, Erich: *See—*
Schneider, Ferdinand; Reinefeld, Erich; and Dietzel, Walter, 3,746,576.
Reinke, Fritz. Method of making bubble-free, fiber reinforced plastic laminates by tamping operations. 3,746,589, Cl. 156-73.000.
Reisinger, Andrew J. Pin ball game apparatus with supplemented manual. 3,746,341, Cl. 273-121.00a.
Relhor S.A.: *See—*
Bechtiger, Charles G., 3,746,808.
Remington Arms Company, Inc.: *See—*
Scanlon, John J., 3,745,924.
Remning, Ake Gustaf Vilhelm: *See—*
Jonason, Karl Gunnar; Karlsson, Karl Harry; and Remning, Ake Gustaf Vilhelm, 3,745,631.
Renz, Robert, to Transformation Union Aktiengesellschaft. Faraday effect apparatus for measuring very high currents particularly direct currents. 3,746,983, Cl. 324-96.000.
Republic Steel Corporation: *See—*
Mandula, Joseph M., Jr.; Fox, John B.; and Bricker, John K., 3,746,972.
Resources Control Corporation: *See—*
Aaron, Maurice E.; and Armstrong, Leonard (said Aaron assor. to), 3,745,856.
Reuschel, Konrad: *See—*
Dietze, Wolfgang; Reuschel, Konrad; and Sandmann, Herbert, 3,746,496.
Rex Chainbelt Inc.: *See—*
Schrader, Preston H., 3,746,149.
Rexham Corporation: *See—*
Young, Chauncey, 3,746,243.
Rexnord Inc.: *See—*
Dieringer, Andrew M., 3,745,930.
Rey, Hans-Georg: *See—*
Bergmeyer, Hans Ulrich; Bernt, Erich; and Rey, Hans-Georg, 3,746,625.
Reynolds, Alex J. Foamed plastic laminate and method of making same. 3,746,604, Cl. 161-69.000.
Reynolds, R. J., Tobacco Company: *See—*
Leffingwell, John Charles, 3,746,010.
Rheem Manufacturing Company: *See—*
Rasmussen, Ronald J., 3,745,781.
Rheinmetall G.m.b.H.: *See—*
Metz, Josef; and Zielinski, Erich, 3,745,880.
Rhodes, Gordon: *See—*
Aitken, Ian Donald; Rhodes, Gordon; and Spencer, Raymond Anthony Philip, 3,746,506.
Rhodes, Paul Cephas; and Cope, Stanley Temple, to Imperial Chemical Industries, Limited. Influencing sedimentation. 3,745,771, Cl. 61-38.000.
Richardson, Billy Joe, to Southwire Company. Method of pouring molten metal. 3,746,072, Cl. 164-87.000.
Richters, Hans: *See—*
Urban, Norbert; and Richters, Hans, 3,746,209.
Richwell, Gunnar; and Giouvalakis, Antonios I., to Potter Instrument Company, Inc. Dribble circuit. 3,746,277, Cl. 242-182.000.
Ricoh Co., Ltd.: *See—*
Kobayashi, Yugoro, 3,745,905.
Ridley, Jeter L.: *See—*
Gauthier, William D.; and Ridley, Jeter L., 3,745,991.
Riecke, Louis G., Jr.; and O'Hare, Thomas J., Jr. Guidingly supported adjustable weight vertical lift carriage. 3,746,337, Cl. 272-81.000.
Riedy, Charles H.: *See—*
Duncan, Lane S.; Tamny, Simon Z.; and Riedy, Charles H., 3,746,254.
Riegel Textiles Corporation: *See—*
Brocklehurst, Charles E., 3,745,947.
Rieger, Werner: *See—*
Martin, Wilhelm; and Rieger, Werner, 3,746,827.
Riekkinen, Asko S., to Oy Nokia AB. Device for cooling an electric wire insulated by extrusion. 3,746,021, Cl. 134-122.000.
Riester, William C.: *See—*
Deibel, Raymond A.; and Riester, William C., 3,745,853.
Rigney, James B.: *See—*
Koltuniak, Michael A.; and Rigney, James B., 3,746,967.
Ringer, Kenneth W., to A.R.F. Products, Incorporated. Remote control system. 3,747,108, Cl. 343-225.000.
Ringhand, Kenneth D., to Central Screw Company. Method and apparatus for the assembly of screw blanks and washers. 3,745,599, Cl. 10-155.00a.
Ripley, Marion M., 30% to Lee, Raymond, Organization, Inc., The. Energy absorbing automobile bumper. 3,746,384, Cl. 293-86.000.
Risdon, Merle C.; and Meyer, Ronald A., to Sterigard Corporation, Irvine Industrial Complex. Attaching a dispensing valve to a pressurized dispenser. 3,746,218, Cl. 222-334.000.
Risse, Willis H., to United Filtration Corporation. Air cleaner. 3,745,753, Cl. 55-481.000.
Rissler, Peter, to Siemens Aktiengesellschaft. Release device for flooding spaces subjected to pressure. 3,746,029, Cl. 137-81.000.
RIV-SKF Officine di Villar Perosa S.p.A.: *See—*
Bertone, Pier Felice; Golzio, Pier Giorgio; and Vrola, Vincenzo, 3,745,815.
Rixon Inc.: *See—*
Stuart, Richard L., 3,746,800.
Rizzi, Marc A.; and Cutarelli, James, to USM Corporation. Mixing and transporting device and method of mixing and transporting. 3,746,315, Cl. 259-21.000.
Rizzi, Marc A.; Hold, Peter; D'Amato, Dominic A.; and Ramazzotti, Dario J., to USM Corporation. Apparatus for injecting molding reinforced plastic articles. 3,746,489, Cl. 425-205.000.
Roberts, Thomas G.: *See—*
Shatas, Romas A.; Roberts, Thomas G.; Stettler, John D.; and Meyer, Harry C., III, 3,746,860.
Robertshaw Controls Company: *See—*
Boyle, Donald A., 3,746,028.
Demi, Roy C., 3,746,039.
Goodhouse, Carl J.; and Niemand, Emil, 3,746,250.
Robillard, Edward G.: *See—*

Hahn, Robert S.; Lindsay, Richard P.; Robillard, Edward G.; and Youden, David H., 3,745,710.

Robinson, Charles E. Fluidic circuit control for centering sanding belt on a belt sander. 3,745,717, Cl. 51-135.0bt.

Robinson, Merritt A., to Fieldhome Equipment Corporation. Cargo carrying vehicle construction. 3,746,388, Cl. 296-28.00m.

Robinson, Norman Robert: *See—*
Pask, George; and Robinson, Norman Robert, 3,745,629.

Robinson, Ralph C., to General Time Corporation. Geneva type mechanism for use in clock timer or the like. 3,745,852, Cl. 74-436.000.

Robson, Francis Lambert: *See—*
Smale, John Reginald; and Robson, Francis Lambert, 3,746,349.

Rocco, William A.: *See—*
Wentorf, Robert H., Jr.; and Rocco, William A., 3,745,623.

Rocha, John G., to United States of America, Army. Telescoping ammunition launcher. 3,745,876, Cl. 89-1.700.

Rodia, Ralph M.: *See—*
Pews, R. Garth; and Rodia, Ralph M., 3,746,739.

Rodriguez, Juan A.: *See—*
Bailey, David L.; Fiorino, Benjamin C.; and Rodriguez, Juan A., 3,747,079.

Rogachev, Boris Vasilievich; Organovsky, Naum Abramovich; Sedelnikov, Ertel Sergeevich; and Charsky, Mikhail Mikhailovich. Apparatus for measuring electrical resistance of rocks by the amplitude method during geophysical mineral prospective. 3,746,978, Cl.324-6.000.

Rogers, Lynn C.: *See—*
Hunt, Mack W.; and Rogers, Lynn C., 3,746,698.

Rogers, Lynn C., to Continental Oil Company. Grease and rust inhibitor compositions. 3,746,643, Cl. 252-33.000.

Rogg, Herman O.: *See—*
Martin, Harold B.; and Rogg, Herman O., 3,745,874.

Rohm & Haas Company: *See—*
Pagano, Angelo S., 3,746,746.

Roland, George W.: *See—*
Feichtner, John D.; Gottlieb, Milton; and Roland, George W., 3,746,866.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Hartung, Winfried, 3,747,084.

Roller Gear, Ltd.: *See—*
Schotiler, Henry, 3,745,844.

Ronson Corporation: *See—*
Dobie, Alexander Barbour, 3,746,961.

Root, La Verne W., to Jackson Vibrators, Inc. Rail follower assembly. 3,745,929, Cl. 104-8.000.

Roschko, Joseph: *See—*
Desperak, Sam; Roschko, Joseph; and Katz, Max, 3,745,948.

Rose, Frank L., to Bio-Medical Systems, Inc. Vacuum formed support structures and immobilizer devices. 3,745,998, Cl. 128-89.00r.

Rose, Jonathan W., to International Business Machines Corporation. Compensation technique for variations in bit line impedance. 3,747,078, Cl. 340-173.00r.

Rosenberg, Robert B.: *See—*
Solbrig, Charles W.; Weil, Sanford A.; and Rosenberg, Robert B., 3,746,504.

Rosenthal, Wayne O.: *See—*
Owen, Harrold D.; Rosenthal, Wayne O.; and Young, James Douglas, 3,746,091.

Rosenthale, Marvin E.: *See—*
Malis, Jerry L.; and Rosenthale, Marvin E., 3,746,495.

Ross, Adma Schneller; and Curran, William Vincent. 6-(Substituted-phenyl)-5-methyl-4,5-dihydro-3 (2H)-pyridazinones. 3,746,712, Cl. 260-250.00a.

Rosvold, Warren C., to Raytheon Company. Method of making semiconductor diodes. 3,746,587, Cl. 148-175.000.

Roth, Philip B.: *See—*
Bann, Robert Francis; Moran, William Joseph; and Roth, Philip B., 3,746,505.

Rothstein, Edwin C.; and Ravdin, Bruce, to Life Technology Corporation. Disposable thermometer. 3,745,831, Cl. 73-371.000.

Roto-Finish Company: *See—*
Balz, Gunther W., 3,745,722.

Rotolo, Carmen J., to North American Rockwell Corporation. Paster anticipate circuit. 3,746,272, Cl. 242-58.300.

Rottger, Hans; and Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Driving device for regulator rods of nuclear reactors. 3,746,615, Cl. 176-36.00r.

Roussel-UCLAF: *See—*
Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, 3,746,529.

Rowe, John J., to Singer Company, The. Digitally controlled sine wave generator. 3,746,891, Cl. 307-271.000.

Roy, Robert L., to Colts's Inc. Combination slide latch and takedown mechanism for automatic pistol. 3,745,881, Cl. 89-163.000.

Rubico, Jerome A.; and Batchelder, Charles F., to Batchelder Rubico, Inc. Method of making shoes over sheathed last utilizing a lasting element. 3,745,600, Cl. 12-142.00r.

Rubinstein, Leon: *See—*
Bing, Herbert A.; Brayton, Christopher; and Rubinstein, Leon, 3,745,904.

Ruland, Ross R.: *See—*
Guerre, Robert P.; and Ruland, Ross R., 3,746,499.

Runckel, John L., to Skyline Northwest Corporation. Dental floss dispensing case. 3,746,225, Cl. 225-19.000.

Runtzel, Royal K.; and Goede, Walter F., to Northrop Corporation. Area electron flood gun. 3,746,909, Cl. 315-13.00r.

Rupp, Warren Company, The: *See—*
Rupp, Warren E., 3,746,472.

Rupp, Warren E., to Rupp, Warren Company, The. Submersible electric pump having fluid pressure protective means. 3,746,472, Cl. 417-9.000.

Ruschig, Heinrich; Konig, Johann; Dittmar, Walter; Klatt, Peter; and Duwel, Dieter. Dioxocyclohexane carboxylic and thiocarboxylic acid anilides. 3,746,765, Cl. 260-551.00s.

Ruschke, Lawrence J., Jr., to Bell & Howell Company. Multiple-torque slip clutch. 3,746,137, Cl. 192-48.500.

Rush, Leslie V., Sr., to Berivon Company, The. Apparatus for the reduction of bone fractures. 3,745,996, Cl. 128-84.00b.

Rutherford, Robert C.; and Loquai, John R., to Owatonna Tool Company. Axle tooling. 3,745,637, Cl. 29-261.000.

Ryabinin, Jury Nikolaevich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.

Ryan, Kelly P., to Blair Manufacturing Co., Inc. Slip clutch. 3,745,790, Cl. 64-29.000.

Ryan, Thomas J.: *See—*
Dieter, Jerry A.; Wolgemuth, Larry G.; and Ryan, Thomas J., 3,746,667.

Rybarczyk, Frederick, to Owens-Illinois, Inc. Noble metal, glass binder compositions and methods of using same. 3,746,568, Cl. 117-95.000.

Ryen, Ronald G. Rotary radial piston engine. 3,746,480, Cl. 418-37.000.

Sachs, Reynold M.; Boutin, Henri P.; and Cicchiello, Frank, to Phonics Corporation. Telephone communication system for the hearing impaired. 3,746,793, Cl. 179-2.0dp.

Sadahiro, Takeshi: *See—*
Yamaya, Susumu; and Sadahiro, Takeshi, 3,746,517.

S.A.E.S. Getters S.p.A.: *See—*
Porta, Paolo Della; Giorgi, Tiziano A.; Kindl, Bruno; and Zucchinelli, Mario, 3,746,658.

Saint-Gobain: *See—*
Kirchheim, Jean-Jacques, 3,746,524.

Saito, Mashiro; Tanizaki, Yoshiharu; Furuta, Keiichi; and Minagawa, Kenichiro, to Nippon Oils and Fats Company Limited. Polyether series synthetic lubricating oil compositions. 3,746,645, Cl. 252-51.50a.

Saito, Osamu, to Hitachi, Ltd. Vacuum circuit breaker. 3,746,811, Cl. 200-144.00b.

Sakamoto, Hitoshi: *See—*
Kotera, Noboru; Nishikawa, Satoru; and Sakamoto, Hitoshi, 3,746,651.

Sako, Eiji; and Kawamura, Osamu, to Green Cross Corporation, The. Coated plastic container for liquid medicine. 3,746,196, Cl. 215-1.00c.

Salem Tool Company, The: *See—*
Young, William G.; and Horning, Frederick G., 3,746,110.

Salyer, Ival O.; and Jefferson, Robert T., to Monsanto Research Corporation. Cigarette filter. 3,746,014, Cl. 131-269.000.

Salyer, Ival O.; and Blardinelli, Albert J., to United States of America, Health, Education and Welfare, mesne. Thromboresistant articles made from polyurethane containing a polypropylene glycol-ethylene oxide block copolymer. 3,746,683, Cl. 260-33.20r.

San Bar Electronics Corporation: *See—*
Fitzsimons, Alan R.; and Mazac, Frank P., 3,746,795.

San Roman, Guillermo: *See—*
Nebolsine, Ross; and San Roman, Guillermo, 3,746,172.

Sanchez, Anastacio V. Apparatus for repairing deformed yieldable structures. 3,745,809, Cl. 72-479.000.

Sanders, Vernard W., to Norris Industries, Inc. Cylinder retention means. 3,745,795, Cl. 70-451.000.

Sanderson, Karl, 1/2 to Wilson, Lee, Engineering Company of Canada, Ltd. Continuous passage of metal slabs through heating furnace. 3,746,501, Cl. 432-6.000.

Sandi, Floyd J.; and Schawinsky, Terry K., to Essex International, Inc. Pushbutton switch control assembly with flexible cord or equivalent allowing operation of one pushbutton and associated switch at a time. 3,746,802, Cl. 200-5.00e.

Sandmann, Herbert: *See—*
Dietze, Wolfgang; Reuschel, Konrad; and Sandmann, Herbert, 3,746,496.

Sandoz Ltd.: *See—*
Littlewood, Peter Stuart, 3,746,720.

Sangamo Electric Company: *See—*
Bruner, James N.; and McAuliff, Dan, 3,747,068.

Sangiorgio, Louis: *See—*
Stock, Alvin L.; Wittig, Herman H.; and Sangiorgio, Louis, 3,746,463.

Sano, Hisumi: *See—*
Naraoka, Kiyotake; Sano, Hisumi; and Itoh, Yokichi, 3,746,944.

Sapkus, Jurgis; Lewis, J. Stephen; Leidtke, Ronald R.; and Villasana, Armando P., to Mattel, Inc. Doll having means for changing facial expression upon turning of head. 3,745,696, Cl. 46-135.00r.

Sasnett, Michael W., to United States of America, Air Force. Injection-locked laser stabilizer. 3,747,004, Cl. 330-4.300.

Sasnett, Russell M.; and Stiner, James E., to General Electric Company. Modular furniture system and means for manipulating and connecting components thereof. 3,746,416, Cl. 312-198.000.

Sasnett, Russell M., to General Electric Company. Furniture system having means for connecting sub-assemblies thereof. 3,746,417, Cl. 312-198.000.

Sasse, Klaus, to Bayer Aktiengesellschaft. 4-Substituted 2-amino-1,3,4-thiadiazolones-(5) and process for their preparation. 3,746,719, Cl. 260-306.80d.

Sather, Kenneth E. Straw in bottle. 3,746,197, Cl. 215-1.00a.

Sato, Tomoyuki: *See—*
Horibe, Koichi; Kaneko, Shoji; Sato, Tomoyuki; and Haniu, Kiyoshi, 3,746,771.

Satomura, Masato: *See—*
Hayakawa, Yoshihide; and Satomura, Masato, 3,746,542.

Saucier, Rene: *See—*
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,746,623.

Sauer, Gale E., to Flangeklamp Corporation. Locking connection for supporting grid systems. 3,746,379, Cl. 287-189.36a.

Saunders, Paul D., to Westinghouse Electric Corporation. Device for attaching turbine blades to a rotor. 3,746,468, Cl. 416-204.000.

Savage, Milton B. Lens edge-grinding, finishing and beveling machine. 3,745,720, Cl. 51-101.01g.

Sawada, Akihisa; and Fujimori, Katsuzo, to Alps Electric Co., Ltd. Support device for a tuner actuator. 3,745,837, Cl. 74-10.390.

Sawaki, Tsukasa: *See—*
Kano, Gota; Iizuka, Mutsuo; Fujiwara, Shohei; Hasegawa, Hiromasa; and Sawaki, Tsukasa, 3,746,950.

Sawyer, Alan B., to Andco Incorporated. Gas scrubber. 3,746,322, Cl. 261-53.000.

Scanlon, John J., to Remington Arms Company, Inc. Plastic cartridge case. 3,745,924, Cl. 102-43.00p.

Scantlebury, Clifford V., to Erie Universal Products Company. Apparatus for applying a pattern to an article. 3,745,970, Cl. 118-50.000.

Schabert, Hans-Peter: *See—*
Rottger, Hans; and Schabert, Hans-Peter, 3,746,615.

Schacht, Guenther H.: *See—*
Perry, Francis J.; and Schacht, Guenther H., 3,745,918.

Schaepman, Ellert, to ITT Industries, Inc. Method and apparatus for determining certain accelerations in an antiskid system. 3,746,925, Cl. 317-5.000.

Schaller, Rudolf, to Siemens Aktiengesellschaft. Model rail structure with reduced electrical interference radiation for electrically driven toys. 3,746,252, Cl. 238-10.00e.

Schanze, Klaus: *See—*
Forster, Karl-Heinz; Vetter, Lothar; Johne, Hans; and Schanze, Klaus, 3,746,957.

Schawinsky, Terry K.: *See—*
Sandi, Floyd J.; and Schawinsky, Terry K., 3,746,802.

Schbenk, Walter J., to Dow Chemical Company, The. Apparatus for the production of net-like structures. 3,746,485, Cl. 425-131.000.

Schefer, Manfred: *See—*
Heinemann, Otto; Schefer, Manfred; Schossler, Werner; and Philipp, Rainer, 3,745,667.

Scheffer, Harry, to Kruger, Harry, GmbH. Thrust piston motor operating with a gaseous fluid medium. 3,745,886, Cl. 91-306.000.

Scheiber, Peter. Multidirectional sound system. 3,746,792, Cl. 179-1.0gq.

Schenck, Carl, Maschinenfabrik GmbH, Firma: *See—*
Heiland, Manfred, 3,746,409.

Scherb, Gustav; and Auer, Norbert, to Vereinigte Osterreichische Eisen- und Stahlwerke Aktiengesellschaft. Shearing machine. 3,745,867, Cl. 83-554.000.

Schey, John A., to IIT Research Institute. Method for treating materials. 3,746,071, Cl. 164-87.000.

Schick, Frederick A., to Dura Corporation. Headlight tester. 3,746,449, Cl. 356-121.000.

Schieving, Jean: *See—*
Iteboul, James Remy Albert; Baude, Andre Rene; and Schieving, Jean, 3,746,452.

Schiffelbein, Richard A. Concrete delivery chute attachment. 3,746,140, Cl. 193-5.000.

Schild, A., S.A.: *See—*
Zaugg, Roland, 3,745,763.

Schimmel, Bernd: *See—*
Bauer, Karl; Mayer, Manfred; Illg, Peter; and Schimmel, Bernd, 3,746,233.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Screw extruder with internal static mixing assembly. 3,746,318, Cl. 259-191.000.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Gear pump for viscous thermoplastic melts. 3,746,481, Cl. 418-83.000.

Schittenhelm, Jean Albert. Chassis frame. 3,746,362, Cl. 280-106.00t.

Schlafhorst, W., & Co.: *See—*
Anderheggen, Manfred; and Buhren, Heinz, 3,746,212.

Schleyer, Meinlof: *See—*
Kluge, Johannes; Rabe, Peter; Schmidt, Otto; and Schleyer, Meinlof, 3,746,812.

Schlotthauer, Wayne W., to Lassen Foods, Inc. Cereal toasting oven. 3,745,909, Cl. 99-323.900.

Schlottmann, Dietrich: *See—*
Dallach, Gerd; Dudszus, Alfred; Fretwurst, Lothar; Granz, Jochen; and Schlottmann, Dietrich, 3,746,466.

Schlumberger Technology Corporation: *See—*
Garcia, Donald J., 3,747,059.
Mullins, Albert A., 3,746,093.

Schmeling, Carl J.: *See—*
Kallfelz, Albert J.; and Schmeling, Carl J., 3,745,801.

Schmidt, Erich: *See—*
Fischer, Artur; Porlein, Gerhard; and Schmidt, Erich, 3,745,736.

Schmidt, Otto: *See—*
Kluge, Johannes; Rabe, Peter; Schmidt, Otto; and Schleyer, Meinlof, 3,746,812.

Schmidt, Peter: *See—*
Zechnall, Richard; Schmidt, Peter; and Wahl, Josef, 3,745,768.

Schmied, Peter: *See—*
Kocher, Hans; and Schmied, Peter, 3,745,762.

Schmuck, James E.; and Troy, Walter C., to Amsted Industries, Incorporated. Method of casting hollow metal balls. 3,746,073, Cl. 164-116.000.

Schmuck, Karl Heinz: *See—*
Spiroch, Franz N.; and Schmuck, Karl Heinz, 3,746,180.

Schneider, Ferdinand; Reinefeld, Erich; and Dietzel, Walter, to Braunschweigische Maschinenbauanstalt. Method of defoaming of sugar liquor in counter-current chip-mixers. 3,746,576, Cl. 127-45.000.

Schneider, Gerhart: *See—*
Mohr, Gunther; Erdmann, Dietrich; Niethammer, Konrad; and Schneider, Gerhart, 3,746,740.

Schneider, Johannes; and Pungs, Wolfgang, to Dynamit Nobel Aktiengesellschaft. Polyamide articles of reduced vapor permeability. 3,746,565, Cl. 117-94.000.

Schneider, William C., Jr.: *See—*
Druschel, William O.; Karsch, Arthur F.; and Schneider, William C., Jr., 3,745,897.

Scholten-Honig Research N.V.: *See—*
Berkhout, Frans; and Wilhelmus, Hermanus Johannes, 3,746,558.
Lolkema, Jan, 3,746,690.

Schoneborn, Hellmuth, to Bolkow Gesellschaft mit beschrankter Haftung. System for the radio transmission of guidance signals to self-propelled bodies. 3,746,288, Cl. 244-3.140.

Schossler, Werner: *See—*
Heinemann, Otto; Schefer, Manfred; Schossler, Werner; and Philipp, Rainer, 3,745,667.

Schotiler, Henry, to Roller Gear, Ltd. Variable speed drive transmission. 3,745,844, Cl. 74-198.000.

Schotman, Jan: *See—*
Berthiaume, Pierre P.; Bowler, William; Cass, George Robert; Schotman, Jan; Scott, J. Frank; and Thivierge, Jacques, 3,746,111.

Schott, Emilio: *See—*
Meisels, Alex; and Schott, Emilio, 3,746,717.

Schrader, Preston H., to Rex Chainbelt Inc. Reversible vibratory feeder. 3,746,149, Cl. 198-220.0cg.

Schrader, William A.: *See—*
Dennis, Paul A.; and Schrader, William A., 3,746,278.

Schrape, Peter: *See—*
Worner, Gunter; and Schrape, Peter, 3,745,847.

Schroeder, Henry Charles; and Sheehan, John Robert, to Bell Telephone Laboratories, Incorporated. Digital demodulator for phase-modulated data transmission systems. 3,746,995, Cl. 325-320.000.

Schroeder, Peter H., Sr., to Thorough-Bread Industries, Limited. Dough kneading apparatus and method of producing baked products. 3,746,317, Cl. 259-185.000.

Schuierer, Erich; Hoffmann, Dieter; and Rebsoat, Siegfried, to Farbwreke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Polyglycol-ethylene-imine derivatives. 3,746,742, Cl. 260-471.00c.

Schuierer, Manfred, to Bruckner-Apparatel u GmbH. Drying of fabrics treated with chlorinated hydrocarbons. 3,745,666, Cl. 34-12.000.

Schulke, Edward W.: *See—*
Beilke, James E.; and Schulke, Edward W., 3,746,195.

Schulman, Stanley W. Natural heat cap. 3,746,015, Cl. 132-9.000.

Schulz, Herman C.: *See—*
Murre, Robert W.; and Schulz, Herman C., 3,745,863.

Schulze, Fritz H., to Comten. Method of and apparatus for band rate detection. 3,747,074, Cl. 340-172.500.

Schwab, Hilde, nee Gitschel; and Zembold, Heinz, to Nippon Seal Co., Ltd. Apparatus for cleaning the textile articles. 3,745,605, Cl. 15-400.000.

Schwartz, Anthony M.; and Rader, Charles A., to United States of America, Agriculture. Mothproofing wool. 3,746,767, Cl. 424-329.000.

Schwarz, Eckhard C. A.; and Bartels, Philip R., to Kimberly-Clark Corporation. Dielectric copying sheet. 3,746,574, Cl. 117-201.000.

Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH: *See—*
Hartmann, Uwe, 3,746,922.

Schwenk, Kurt, to Volkswagenwerk Aktiengesellschaft. Floor assembly for motor vehicles. 3,746,387, Cl. 296-28.00f.

Schwingshandl, John. Air cushion vehicle. 3,746,116, Cl. 180-121.000.

Sciaky, David, to Welding Research, Inc. Method for electron beam welding at high speeds. 3,746,831, Cl. 219-121.0em.

SCM (Canada) Ltd.: *See—*

Story, Laurence A., 3,745,971.
SCM Corporation: *See—*
Bordenca, Carl; Dorschner, Kenneth P.; and Johnson, Robert P., 3,746,768.
Zielinski, Richard J.; and Gilmore, Cecilia, 3,746,552.
Scott, J. Frank: *See—*
Berthiaume, Pierre P.; Bowler, William; Cass, George Robert; Schotman, Jan; Scott, J. Frank; and Thivierge, Jacques, 3,746,111.
Scott Machine Development Corporation: *See—*
Williams, Thomas A., 3,745,740.
Scott Paper Company: *See—*
Kitch, Paul Edward, 3,746,448.
Scovill Manufacturing Company: *See—*
Daddona, Domenic John, Jr., 3,745,613.
Leason, Hayden, 3,746,595.
Seager, Richard H., to General Electric Company. Four-quadrant indicator employing moire effect. 3,745,966, Cl. 116-124.000.
Searle, G. D., & Co.: *See—*
Tweit, Robert C., 3,746,716.
Seckerson, Clifford Alexander, to TRW Inc. Resilient fasteners. 3,745,612, Cl. 24-73.0pf.
Sedelnikov, Ertel Sergeevich: *See—*
Rogachev, Boris Vasilievich; Organovsky, Naum Abramovich; Sedelnikov, Ertel Sergeevich; and Charsky, Mikhail Mikhailovich, 3,746,978.
Sedgwick, Gordon; Lindop, Roy; and Nelson, Tom Worsley, to Lucas, Joseph, (Industries) Limited. Joint arrangements. 3,746,374, Cl. 285-187.000.
Seeley, Leonard, to Plastofilm Industries, Inc. Two-cavity syringe package. 3,746,155, Cl. 206-43.000.
Sehgal, Surendra N.: *See—*
Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., 3,746,623.
Seipel, John Joseph, Jr. Coating compositions containing aqueous dispersions of ethylene-vinyl acetate copolymers. 3,746,679, Cl. 260-29.6me.
Seiple, Ronald L., to United States of America, Navy. Resilient marine mammal nose cup. 3,745,976, Cl. 119-129.000.
Seiter, William A.; and Christensen, Calvin J. Emergency light unit. 3,746,877, Cl. 307-66.000.
Seitz, Richard L., to Veeder Industries, Inc. Fuel pump register reset mechanism. 3,745,836, Cl. 74-2.000.
Selin, Terry G.: *See—*
Berger, Abe; and Selin, Terry G., 3,746,734.
Sels, Francis Jeanne: *See—*
Pollet, Robert Joseph; Willems, Jozef Frans; Sels, Francis Jeanne; and Philippaerts, Herman Adelbert, 3,746,545.
Selwood, Alan, to Imperial Chemical Industries Limited. Method of making textile yarns. 3,745,757, Cl. 57-157.00r.
Semerchan, Aik Akopovich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.
Semyashkevich, Boris Pavlovich: *See—*
Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich, 3,746,484.
Senard, Pierre Adolphe Maurice. Method for smoothing endless strips. 3,745,802, Cl. 72-164.000.
Serck Idustries Limited: *See—*
Dawber, Edmund Norman, 3,746,030.
Serembe, Ezio. Magnetic plate for drawing desk lining. 3,746,992, Cl. 335-285.000.
Serritella, Angela C.: *See—*
Hand, Hi; and Serritella, Angela C., 3,746,007.
Seymour, Paul R., to Container Corporation of America. Moulded container. 3,746,241, Cl. 229-15.000.
Shaffer, James O., to Wean Industries, Inc. Transferring and stacking elongated members. 3,746,187, Cl. 214-6.00h.
Shapiro, D. Morris. Magnetic game board especially for sightless persons. 3,746,343, Cl. 273-136.00b.
Sharki, Martin J.: *See—*
Griffin, Phil H., III; and Sharki, Martin J., 3,746,102.
Sharp, Donald Jex, to Western Electric Company, Incorporated. Method of irradiating a non-line-of-sight surface of a substrate. 3,746,541, Cl. 96-38.400.
Sharp, Frank W., Jr., to Offshore Company, The. Underwater anchor structure and method of setting same. 3,745,774, Cl. 61-46.000.
Sharp, Marvin L.: *See—*
Marsland, William P.; and Sharp, Marvin L., 3,746,490.
Sharp, Thomas H. Adjustable wrench. 3,745,862, Cl. 81-147.000.
Sharples, Kenneth R. Analog to digital converter. 3,747,089, Cl. 340-347.0nt.
Sharpless, Graham Trevor, to U.S. Philips Corporation. Electrical display devices. 3,747,073, Cl. 340-172.500.
Shatas, Romas A.; Roberts, Thomas G.; Stettler, John D.; and Meyer, Harry C., III. Soft X-ray generator assisted by laser. 3,746,860, Cl. 250-84.000.
Shaw, Wilfrid G.: *See—*
Miller, Arthur F.; Shaw, Wilfrid G.; and Blythe, Hugh M., 3,746,657.
Shearer, Harry Douglas: *See—*
Dalaokis, Eli James; and Shearer, Harry Douglas, 3,747,106.
Sheehan, John Robert: *See—*
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Sheldon, E. H., and Company: *See—*
Morrison, Robert B., 3,746,213.
Sheldon, James B., to Gulton Industries, Inc. Pressure transducer. 3,747,042, Cl. 338-42.000.
Sheldon, Luther M.: *See—*
Cressman, Robert C.; and Sheldon, Luther M., 3,747,049.
Sheldon, Luther M., to General Electric Company. Clamp for blade for higher rating caps. 3,747,052, Cl. 339-272.0vc.
Shell Oil Company: *See—*
Darley, Henry C. H., 3,746,109.
Kollmeyer, Willy D.; and Pilgram, Kurt H. G., 3,746,704.
Marshall, Clifford D.; Byrd, Paul S.; and Dante, Mark F., 3,746,686.
Marsland, William P.; and Sharp, Marvin L., 3,746,490.
Pilgram, Kurt H. G.; and Skiles, Richard D., 3,746,727.
Shelton, Joe; Hagood, Jerry W.; and Norman, Ralph L., to United States of America, Army. High vacuum, field effect electron tube. 3,746,905, Cl. 313-309.000.
Sheppard, Chester Stephen; and Korczykowski, Leonard Earnest, to Pennwalt Corporation. N-monohalomonosubstituted ureas. 3,746,760, Cl. 260-543.00a.
Sherburne, Frederick B.: *See—*
Jasper, Louis J., Jr.; de Santis, Charles M.; and Sherburne, Frederick B., 3,746,915.
Sherman, Phillip Leland: *See—*
Gledhill, William; and Sherman, Phillip Leland, 3,746,368.
Shibata, Katsuya: *See—*
Adachi, Kazuo; Tai, Akira; Higashi, Fukuji; and Shibata, Katsuya, 3,746,684.
Shilliday, Douglas J. Orthodontic gauge device for indicating interincisal angles. 3,745,665, Cl. 33-174.00d.
Shimazaki, Eiki; Araki, Shunji; and Akazawa, Hakuichi, to Taki Fertilizer Manufacturing Co., Ltd. Hardening agent for refractory use and production thereof. 3,746,557, Cl. 106-65.000.
Shimizu, Shinkichi: *See—*
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Ichihashi, Hiroshi, 3,746,656.
Shimoda, Mitsuhiko: *See—*
Miyakawa, Seinan; Noda, Nobuhiro; and Shimoda, Mitsuhiko, 3,745,901.
Shionogi, Co., Ltd.: *See—*
Sumimoto, Shinzaburo; and Takase, Akira, 3,746,736.
Shipstad, Donald R. Hand enclosure for ski poles. 3,746,356, Cl. 280-11.37h.
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Ichihashi, Hiroshi, to Sumitomo Chemical Company, Limited. Catalyst for the production of acrylonitrile. 3,746,656, Cl. 252-437.000.
Shirazawa, Takashi: *See—*
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Shklair, Irving L.: *See—*
Hoerman, Kirk C.; Shklair, Irving L.; Klima, James E.; and Simonson, Lloyd G., 3,746,624.
Shoemaker, Arthur M., to American Optical Corporation. Oil immersion type microscope objective. 3,746,428, Cl. 350-214.000.
Shoemaker, Harold D.: *See—*
Diener, Robert G.; Reeder, Randall C.; and Shoemaker, Harold D., 3,746,264.
Sholtes, Carl E., to Westinghouse Electric Corporation. Water cooler unit frame assembly. 3,746,290, Cl. 248-15.000.
Shultz, William M.: *See—*
Coffey, Charles S.; Gornstein, Robert J.; and Shultz, William M., 3,745,959.
Shyhalla, Nicholas, to Textron, Inc. Planar dipole array mounted on dielectric substrate. 3,747,114, Cl. 343-795.000.
Sibbach, William: *See—*
Harmon, Carlyle; and Sibbach, William, 3,746,607.
Siden, Terry C. Disposable capillary-reservoir pen for graphica recorder. 3,747,121, Cl. 346-140.000.
Sides, James R.: *See—*
Tanner, Ernst; and Sides, James R., 3,745,927.
Sidles, James: *See—*
Bartley, Donald R.; and Sidles, James, 3,746,590.
Siegfriedt, Ernest E., Jr.; and Bramhall, Otis H., to TRW Inc. Method of manufacturing electrical contacts. 3,746,583, Cl. 148-13.000.
Siemens Aktiengesellschaft: *See—*
Dietze, Wolfgang; Reuschel, Konrad; and Sandmann, Herbert, 3,746,496.
Gebhardt, Hartmut, 3,746,796.
Goser, Karl, 3,747,077.
Hermstein, Wolfgang, 3,746,424.
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Hotz, Karl, 3,746,208.
Pammer, Erich; and Folkmann, Eduard, 3,746,569.
Rausch, Manfred, 3,746,287.
Rissler, Peter, 3,746,029.
Rottger, Hans; and Schabert, Hans-Peter, 3,746,615.
Schaller, Rudolf, 3,746,252.
Siglow, Joachim, 3,747,003.

Stein, Karl-Ulrich, 3,746,934.
Wiesner, Richard, 3,745,648.

Siglow, Joachim, to Siemens Aktiengesellschaft. Circuitry for demodulation of phase difference modulated data signals. 3,747,003, Cl. 329-104.000.

Signal Communications, Inc.: *See—*
Viger, George P., Jr., 3,746,878.

Silde, Valentin: *See—*
Malkki, Eino Kalervo; and Silde, Valentin, 3,745,632.

Silvia, Loretta R. Ballasted wig block and/or stand for a wig block. 3,746,293, Cl. 248-177.000.

Simmons, Harold C., to Parker-Hannifin Corporation. Fuel head compensating valve for fuel injection nozzle. 3,746,038, Cl. 137-513.500.

Simms, John A.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Aziridinyl alkyl-acrylate or methacrylate graft copolymers. 3,746,673, Cl. 260-22.0cb.

Simonson, Lloyd G.: *See—*
Hoerman, Kirk C.; Shklair, Irving L.; Klima, James E.; and Simonson, Lloyd G., 3,746,624.

Simplec Mfg., Co.: *See—*
Hudson, James Elmore, Jr., 3,747,063.

Simpson, Merle A.; and Heptig, Albert S. Interlocking building construction. 3,745,731, Cl. 52-236.000.

Singer Company, The: *See—*
Peters, David L., 3,746,778.
Rowe, John J., 3,746,891.

Singer Company, The, mesne: *See—*
Gamertsfelder, George R., 3,747,094.
Gamertsfelder, George R.; Goldfischer, Lester I.; McKendry, John K.; and Vesper, Richard M., 3,747,103.
Mortimer, Charles P. L., 3,745,671.

Singer, Ernst. Float level control apparatus. 3,746,035, Cl. 137-416.000.

Singer, Frederic J. Corrosion resistant manhole shaft and method of making same. 3,745,738, Cl. 52-741.000.

Skau, Evald L.: *See—*
Mod, Robert R.; Magne, Frank C.; and Skau, Evald L., 3,746,722.

Skiles, Richard D.: *See—*
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Skoda narodni podnik: *See—*
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Skoog, Hans O.: *See—*
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Skurski, James K.: *See—*
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Skyline Northwest Corporation: *See—*
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Slater, Richard F.: *See—*
Pavlath, Attila E.; and Slater, Richard F., 3,746,858.

Slattery, Brian R.: *See—*
Hoyler, Robert C.; Slattery, Brian R.; and Thorne-Booth, George M., 3,746,857.

Sletzinger, Meyer: *See—*
Karady, Sandor; Pines, Seemon H.; Ly, Manuel G.; and Sletzinger, Meyer, 3,746,753.

Sliwkowski, Joseph J., to Computervision Corporation. Exposure control system and method for photoplotters. 3,746,446, Cl. 355-68.000.

Slomo, Stephen: *See—*
Chakrabarti, Jiban Kumar; and Slomo, Stephen, 3,746,761.

Smale, John Reginald; and Robson, Francis Lambert. Mechanical seals and/or thrust bearings. 3,746,349, Cl. 277-67.000.

Smiley, Vern N., to United States of America, Navy. Wide range continuously tunable thin film laser. 3,747,021, Cl. 331-94.500.

Smiltneck, Ralmond J. Debarking process and apparatus. 3,746,063, Cl. 144-208.00e.

Smith, A. O., Corporation: *See—*
Swanson, Philip E.; and Tor, Charles J., 3,745,827.

Smith, Arthur Dean: *See—*
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Smith, Beatrice A.: *See—*
Leopold, Wilbur R.; and Smith, John J., 3,746,371.

Smith, Billy E., to Gulf Oil Corporation. Method for cleaning oil tanker holds. 3,746,023, Cl. 134-22.00r.

Smith, Gerald D.; and Carson Manufacturing Company, Inc. Electronic siren circuit. 3,747,092, Cl. 340-384.00e.

Smith, John J.: *See—*
Leopold, Wilbur R.; and Smith, John J., 3,746,371.

Smith Kline & French Laboratories, Inc.: *See—*
Gordon, Maxwell; and Weisbach, Jerry A., 3,746,728.

Smith, Leonard A., Jr., to Monsanto Company. Apparatus for bulking yarn. 3,745,617, Cl. 28-1.400.

Smith, Lloyd L., to United States of America, Agriculture. Air static pressure and temperature measuring device for remote locations in stored porous material. 3,745,835, Cl. 73-345.000.

Smith, Luther W., Jr., to American Optical Corporation. Method and apparatus for inspecting surface treated ophthalmic lenses. 3,746,450, Cl. 356-135.000.

Smith, Rossman W., Jr., to Gulf Research & Development Company. Remote surface temperature determination. 3,745,830, Cl. 73-344.000.

Smith, Russell G.; and Belaef, Nikolai, to Xomox Corporation. Flow indicator. 3,745,967, Cl. 116-117.00r.

Smith, Siegfred Alexander: *See—*
Huffman, Ralph Richard; and Smith, Siegfred Alexander, 3,745,969.

Smith, William E., to California Computer Products, Inc. Marker enlarger. 3,746,447, Cl. 355-84.000.

Smithe, F. L., Machine Company, Inc.: *See—*
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Smithe, J. L., Machine Company, Inc.: *See—*
Helm, Herbert W.; and O'Keefe, John Gail, 3,745,893.

Snader, Earle S.: *See—*
Zarfoss, James R.; Snader, Earle S.; and Hale, Elden A., Sr., 3,745,907.

Societe Anonyme de Telecommunications: *See—*
Chavany, Jean-Claude, 3,746,422.

Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V.-MARCHAL: *See—*
Stellwagen, Jean Henri, 3,746,805.

Societe Anonyme: Glaenzer Spicer: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Le Viet, Toai, 3,746,822.

Societe d'Etudes de Machines Thermiques: *See—*
Kohn, Karl Walter, 3,746,291.

Societe Generale de Constructions Electriques et Mecaniques (Alsthom): *See—*
Warszawski, Bernard, 3,746,578.

Societe Lannionnaire d'Electronique: *See—*
Canivenc, Serge, 3,747,115.

Societe Nationale Industrielle Aerospatiale: *See—*
Azum, Jacques; and Claustre, Roger, 3,746,844.

Societe Technique de Pulverisation: *See—*
Boris, Michel, 3,746,260.

Societe Viscora: *See—*
Patouillard, Gilbert, 3,745,611.

Sol-Tek Industries, Inc.: *See—*
Guyton, William V., 3,746,964.

Solartron Electronic Group Limited, The: *See—*
Bailey, Christopher Edmund Gervase, 3,746,849.

Solbrig, Charles W.; Weil, Sanford A.; and Rosenberg, Robert B., to American Gas Association, Inc., mesne. Radiant gas burner device for heating. 3,746,504, Cl. 263-2.00r.

Somers, Allen E.: *See—*
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Sommer, Ruediger: *See—*
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Sontrix, Inc.: *See—*
Goble, Ralph W., 3,746,895.

Sony Corporation: *See—*
Kubota, Yasuharu, 3,746,779.
Nakayama, Masayuki, 3,746,781.

Sorber, Siegfried, to Volkswagenwerke Aktiengesellschaft. Sound attenuating structure. 3,746,114, Cl. 181-50.000.

Sorm, Frantisek: *See—*
Ratusky, Josef; and Sorm, Frantisek, 3,746,748.

Sourup, Victor G.: *See—*
Harper, Robert C.; Creeden, G. W.; and Sourup, Victor G., 3,746,311.

Southwire Company: *See—*
Gentry, Bobby C., 3,746,582.
Richardson, Billy Joe, 3,746,072.

S.p.A. Virginio Rinoldi & C.: *See—*
Marforio, Nerino, 3,745,951.

Spadaro, Giorgio L.: *See—*
Litvin, Robert L.; and Spadaro, Giorgio L., 3,745,733.

Sparks, Buddy G., to Murphy, Frank W., Manufacturer, Inc. Safety system incorporating a plurality of control switches. 3,746,926, Cl. 317-9.00b.

Sparlin, Derry D., to Continental Oil Company. Alkyl bis(hydroxyphenyl) alkanoates and aldehyde condensation products thereof. 3,746,095, Cl. 166-295.000.

Spear, Karl E., II: *See—*
Leitnaker, James M.; and Spear, Karl E., II, 3,746,616.

Speidel, John A. Seat and back structure for chairs. 3,746,394, Cl. 297-458.000.

Spencer, Phillip B.; and Hovanchak, John A., to TRW Inc. Hydraulic motor with minimum break-away torque. 3,746,479, Cl. 418-15.000.

Spencer, Raymond Anthony Philip: *See—*
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Sperry Rand Corporation: *See—*
Lodi, Robert J.; and Wegener, Horst A.R., 3,747,072.
Wesner, Charles R., 3,746,843.

Sperti, George S.; and Gerth, Albert E., to St. Thomas Institute. Flash apparatus. 3,745,896, Cl. 95-11.50r.

Spillette, Arthur G.: *See—*
Pierce, Aaron E.; Burns, William A., Jr.; Cooke, Claude E., Jr.; Hillestad, Jerry G.; and Spillette, Arthur G., 3,745,822.

Spindel, Abraham; and Maas, James F., to Recognition Systems, Inc., mesne. Linear variable light attenuator. 3,746,429, Cl. 350-266.000.

Spinner Osakeyhtio: *See—*
Keto, Kalevi, 3,745,755.

Spira, Joel S.; and Licata, Joseph, to Lutron Electronics Co., Inc. Dimmer switch with linearly movable control. 3,746,923, Cl. 315-291.000.

Spiroch, Franz N.; and Schmuck, Karl Heinz, to Eichner Organisation. Device for facilitating the storage of magnetic tape cassettes. 3,746,180, Cl. 211-113.000.

Spivack, John Denon, to Ciba-Geigy Corporation. Phosphine oxide and phosphonyl dichlorides of alkylated p-hydroxyphenylalkanes. 3,746,758, Cl. 260-543.00p.

Splain, Walter E.: *See*—
Lombardo, Daniel F.; and Splain, Walter E., 3,746,862.

Sprague Electric Company: *See*—
Stross, Hans A., 3,747,045.

Sprague, Robert E., to Thornton, F. C., Co., The. Welding and cutting apparatus. 3,746,238, Cl. 228-9.000.

Sprenger, Herbert Alfred. Method for making a bridoon. 3,745,743, Cl. 54-8.000.

Sprocket Properties Limited: *See*—
Hibbert, Sydney George, 3,745,940.

Square D Company: *See*—
Myles, Asa H.; and Erb, Fred, 3,746,954.

Squibb, E. R., & Sons, Inc.: *See*—
Krapcho, John, 3,746,706.

St. Thomas Institute: *See*—
Sperti, George S.; and Gerth, Albert E., 3,745,896.

Stahl, William F., to Westinghouse Electric Corporation. Rotor structure and method of construction. 3,745,628, Cl. 29-156.80r.

Stalter, John D., to Nibco, Inc. Apparatus for molding elbows and the like. 3,746,493, Cl. 425-250.000.

Standard Electric Time Corporation, mesne: *See*—
Ranganath, Gorur Ramaswmiengar, 3,747,093.

Standard Oil Company: *See*—
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Standard Oil Company, The: *See*—
Miller, Arthur F.; Shaw, Wilfrid G.; and Blythe, Hugh M., 3,746,657.

Standard Precision, Inc.: *See*—
Barber, Lloyd L., Jr., 3,746,418.

Stange, Karl; Jenne, Helmut; Weiss, Hans-Peter; and Koenig, Ulrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Laminate of SMA copolymer and polyamide. 3,746,609, Cl. 161-165.000.

Stapfer, Christian H.; and D'Andrea, Richard W. Cobalt II halide hydrazine complexes. 3,746,733, Cl. 260-439.00r.

Staples, Robert E.: *See*—
Knapp, George P.; and Staples, Robert E., 3,746,129.

Stark, Bernard Peter: *See*—
Dobinson, Bryan; Stark, Bernard Peter; and Young, Eric Whichell, 3,746,685.

Static Power, Inc mense: *See*—
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Statni Vyzkumny ustav textilni: *See*—
Mohelnicky, Josef; Zmailik, Josef; and Lisa, Miloslav, 3,746,051.

Stauffer Chemical Company: *See*—
Weil, Edward D.; Fearing, Ralph B.; and Eisenberg, Bernard J., 3,746,572.

Stautzenberger, Adin Lee; and MacLean, Alexander Fiske, to Celanese Corporation. Solubilization of organic acids. 3,746,750, Cl. 260-514.00k.

Stearns, George W., to Wagner Electric Corporation. Control valve and system. 3,746,401, Cl. 303-71.000.

Stein, Karl-Ulrich, to Siemens Aktiengesellschaft. Stack arrangement of semiconductor chips. 3,746,934, Cl. 317-101.0cm.

Steinen, Karl-Heinz; and Trohler, Paul. Storage apparatus. 3,746,188, Cl. 214-16.1cc.

Stellwagen, Jean Henri, to Societe Anonyme pour l'Equipment Electrique des Vehicules S.E.V.-MARCHAL. Jaw like contact breaker assembly module fixedly supported in distributor housing and readily removable therefrom. 3,746,805, Cl. 200-19.00r.

Stemme, Nils Gustaf Erik. Arrangement of writing mechanisms for writing on paper with a colored liquid. 3,747,120, Cl. 346-75.000.

Stemme, Reimer, to Pierres Holding S.A. Holder for disk-shaped workpieces in a processing position. 3,746,183, Cl. 214-113.00v.

Stengel, Mathew Paul, to Combustion Engineering Inc. Reducing NO_x emissions by additive injection. 3,746,498, Cl. 431-4.000.

Stepanek, Frank E.; and Winters, Francis G., to American Home Products Corporation. Merchandising fixture. 3,746,295, Cl. 248-226.00a.

Stephans, J. Larry. Reflector for incandescent lamp. 3,746,856, Cl. 240-81.0ld.

Stephen, John F., to Ciba-Geigy Corporation. Aromatic diimides of 3,5-dialkyl-4-hydroxyphenylsubstituted amines. 3,746,721, Cl. 260-326.00s.

Stephenson, Robert L., to Allied Chemical Corporation. Detonator holder. 3,746,214, Cl. 222-3.000.

Sterigard Corporation, Irvine Industrial Complex: *See*—
Risdon, Merle C.; and Meyer, Ronald A., 3,746,218.

Stermac, Boris. Sliding door. 3,745,706, Cl. 49-425.000.

Sternbach, Leo Henryk: *See*—
Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, 3,746,702.

Stetten, Kenneth J.; and Mayer, Rollin P., to Mitre Corporation, The. Video display system. 3,746,780, Cl. 178-6.60a.

Stettler, John D.: *See*—
Shatas, Romas A.; Roberts, Thomas G.; Stettler, John D.; and Meyer, Harry C., III, 3,746,860.

Stewart, Wilson M., to Vendall Machines Limited. Change making device. 3,746,018, Cl. 133-4.00a.

Stewart-Warner Corporation: *See*—
Little, Arthur J.; and Mayer, William R., 3,747,061.

Stifle, Jack; and Johnson, Michael, to University of Illinois Foundation. Modulator-demodulator apparatus for communication of digital data over voice grade telephone. 3,746,794, Cl. 179-2.0dp.

Stiles, John C.; Tuffias, Robert H.; and Blakely, Roger W., Jr., to Litton Systems, Inc. Ferrohydrodynamic low-friction bearing. 3,746,407, Cl. 308-36.300.

Stiner, James E.: *See*—
Sasnett, Russell M.; and Stiner, James E., 3,746,416.

Stoakes, Donald S.; and Brock, Kenneth D., to Thexton Manufacturing Company. Oil permittivity sensor. 3,746,974, Cl. 324-61.00r.

Stock, Alvin L.; Wittig, Herman H.; and Sangiorgio, Louis, to Westinghouse Electric Corporation. Multi-casing turbine. 3,746,463, Cl. 415-136.000.

Stoffel, Paul J., to Monsanto Company. Trifluoromethyl substituted benzanilides. 3,746,762, Cl. 260-558.00p.

Stollnberger, Peter: *See*—
Lindstedt, Sven; Treiber, Laszlo; Frolunda, Vastra; Stollnberger, Peter; and Tausch, Walter, 3,746,869.

Stone, James S., to Collins Radio Company. Electrical fault monitoring with memory. 3,746,981, Cl. 324-73.00r.

Stone, John G., to Parker-Hannifin Corporation. Sealing ring with retaining means. 3,746,348, Cl. 277-11.000.

Stookey, Lawrence L.; Conetta, Aldo; and Zehnder, Hans. Automated determination of milkfat in milk. 3,746,511, Cl. 23-231.000.

Stoplifter International, Inc., mesne: *See*—
Peterson, Glen, 3,747,086.

Stopper, Herbert, to Burroughs Corporation. Logic circuit using a current switch to compensate for signal deterioration. 3,746,885, Cl. 307-218.000.

Storey, William H., Jr.; and Montalvo, Daniel A., to United States of America, Army, mesne. Sample spinning cell for NMR of flowing systems. 3,746,971, Cl. 324-.50r.

Story, Laurence A., to SCM (Canada) Ltd. Vacuum coating apparatus. 3,745,971, Cl. 118-50.000.

Stotler, David V., to Owens-Corning Fiberglas Corporation. Strand guide apparatus. 3,746,276, Cl. 242-129.000.

Strauff, Gunter, to Langen & Co. Hydraulic servo-steering system. 3,745,769, Cl. 60-392.000.

Strazik, Wihhii F.: *See*—
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Striegl, George, to Temco Contact Ltd. Engine power unit. 3,745,887, Cl. 92-146.000.

Stripling, William W., to United States of America, Army. Hybrid strapdown guidance system. 3,746,281, Cl. 244-3.200.

Strony, Gloria L., to Masterpiece Inc. Artificial shrub suitable for indoor or outdoor use. 3,746,601, Cl. 161-24.000.

Stross, Hans A., to Sprague Electric Company. Lead locking configuration for electrical components. 3,747,045, Cl. 339-17.00c.

Structural Foam Products, Inc.: *See*—
De Vitz, William R., 3,746,492.

Stuart, Richard L., to Rixon Inc. Clock recovery system. 3,746,800, Cl. 178-69.50r.

Stubblefield, Jerry D. Practice javelin. 3,746,334, Cl. 272-59.00r.

Stubstad, James A., to Cutter Laboratories, Inc. Articulating prothesis with ligamentous attachment. 3,745,590, Cl. 3-1.000.

Studey, David K.: *See*—
Kahle, Rolf D.; Studey, David K.; and Bryson, James D., 3,746,444.

Studly, Adolph. View or process type camera. 3,745,903, Cl. 95-51.000.

Styron, James S.: *See*—
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Suda, Toshi; and Nagata, Senichi, to Nippondenso Co., Ltd. Fuel control means for an internal combustion engine. 3,745,982, Cl. 123-102.000.

Sudyk, John R.; and Finefrock, Donald W., to Johnson Rubber Company, The. Water lubricated stave bearing. 3,746,414, Cl. 308-238.000.

Sugita, Minoru: *See*—
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Sullivan, Edward M.: *See*—
Erickson, Wayne D.; and Sullivan, Edward M., 3,745,816.

Sullivan, James P. L. Finger ring and radially compressible adjustable sizing device, and method of fitting a ring. 3,745,788, Cl. 63-15.600.

Sumimoto, Shinzaburo; and Takase, Akira, to Shionogi, Co., Ltd. Process for preparing alpha, beta, unsaturated carbonyl compounds. 3,746,736, Cl. 260-463.000.

Sumitomo Chemical Company, Limited: *See*—
Shiraishi, Tatsuo; Shimizu, Shinkichi; and Ichihashi, Hiroshi, 3,746,656.

Sumitomo Electric Industries Ltd.: *See*—
Hara, Akio; and Yazu, Syuji, 3,746,519.

Summerfield, William F.; and Nuttall, Fleet E., to Mattel, Inc. Aquarium heater. 3,746,836, Cl. 219-328.000.

Sumrell, Gene: *See*—
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Sun Oil Company of Pennsylvania: *See*—
Aulisa, Gerard D., 3,746,370.

Sunbeam Plastics Corporation: *See*—
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Superior Electric Company, The: *See*—
Leenhousts, Albert C., 3,746,958.

Superior Industries, Inc.: *See*—

Pritchard, Harry W.; and Furman, Myron, 3,745,732.
Surloff, Bernard. Variable feed vaporizing diffuser. 3,746,255, Cl. 239-51.500.
Svenska Dataregister AB: *See—*
Englund, Gosta Roland; Israelson, Rolf B.G.; Mattsson, Mats E.; Lindelow, Claes-Goran; and Maxe, Sven-Erik, 3,747,090.
Swanke, Raymond R.: *See—*
Fraser, Jack C. W.; Swanke, Raymond R.; and Arbour, Jules E., III, 3,745,770.
Swanson, Philip E.; and Tor, Charles J., to Smith, A. O., Corporation. Temperature compensation of a liquid flowmeter. 3,745,827, Cl. 73-233.000.
Swarthout, Gerald M. Self-righting fish lure. 3,745,685, Cl. 43-42.340.
Sweeney, Josephine T., 50% to Huff, Warren C. Garment pattern making device and method. 3,745,656, Cl. 33-14.000.
Sweeney, Maxwell Patrick, to Energy Transmission Corporation. Carburetor apparatus and method. 3,745,983, Cl. 123-119.00r.
Swengel, Robert Charles, Sr.; and Crumley, J. A., to AMP Incorporated. Welding method and means using foil electrode. 3,747,051, Cl. 339-275.00t.
Swick, George W., Jr.; Priest, Robert A.; and Trimble, Jerry R., to Cornelius Company, The. Hand cart for stacking goods in interlocking relationship. 3,746,358, Cl. 280-36.00r.
Swift & Company: *See—*
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Swift Sheetmetal Corporation: *See—*
Finkel, Nathan B., 3,746,042.
Sybron Corporation: *See—*
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Syracuse University Research Corporation: *See—*
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Szekely, Andrew G., to Union Carbide Corporation. Method of treating ferrous metals with oxygen containing a non-gaseous fluidized fuel. 3,746,534, Cl. 75-60.000.
Taciuk, William. Drill stem shock absorber. 3,746,330, Cl. 267-137.000.
Taguchi, Tetsuka: *See—*
Ogiso, Mitsutoshi; and Taguchi, Tetsuka, 3,746,892.
Taguchi, Tetsuya, to Canon Kabushiki Kaisha. Self-timer circuit and self timer-device incorporating said self timer circuit. 3,745,902, Cl. 95-53.300.
Tai, Akira: *See—*
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Tait, William C.; Campbell, Donald A.; Packard, James R.; and Dierssen, Gunther H., to Minnesota Mining and Manufacturing Company. Platelet semiconductive laser. 3,747,018, Cl. 331-94.500.
Takahashi, Mitsuhiro, to Nitto Boseki Co., Ltd. Shaped article of synthetic resin having mechanically disordered orientation. 3,746,608, Cl. 161-116.000.
Takahashi, Yoshiro: *See—*
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Takase, Akira: *See—*
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Takata, Harry H., to Raygo, Inc. Earth working machine. 3,746,101, Cl. 172-112.000.
Takeda Chemical Industries, Ltd.: *See—*
Noguchi, Shunsaku; Obayashi, Mikihiko; Minamida, Isao; Kishimoto, Shoji; and Kawai, Kiyohisa, 3,746,751.
Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, 3,746,701.
Takeda, Mutsuo; Nakajima, Takeji; Takahata, Kenji; and Banba, Toshitsugu, to Nippon Kokan Kabushiki Kaisha. Method for the continuous vacuum decarbonization of low carbon ferrochrome. 3,746,584, Cl. 148-13.100.
Takegawa, Hiroyasu, to Toyoda Koki Kabushiki Kaisha. Tape-reading control system for repeat-processing cycles of traverse cutting. 3,746,956, Cl. 318-572.000.
Taketa, Katsumi; Miyoshi, Akeyoshi; and Kobayashi, Terutomo, to Mitsubishi Denki Kabushiki Kaisha. Receiver for centralized controlling apparatus. 3,746,939, Cl. 317-147.000.
Takeuchi, Yoji: *See—*
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Taki Fertilizer Manufacturing Co., Ltd.: *See—*
Shimazaki, Eiki; Araki, Shunji; and Akazawa, Hakuichi, 3,746,557.
Talvalkar, Shashikant G.: *See—*
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Tamny, Simon Z.: *See—*
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Tanabe Kakoki Co., Ltd.: *See—*
Horibe, Koichi; Kaneko, Shoji; Sato, Tomoyuki; and Haniu, Kiyoshi, 3,746,771.
Tanaka, Yasuo: *See—*
Doi, Kazuo; Kato, Ryuzo; Matsumoto, Tadashi; Niizuma, Fujio; Kugumiya, Shigenori; Tanaka, Yasuo; and Kitamura, Motoharau, 3,745,649.
Tanimoto, Kametaro. Wrist exerciser. 3,746,336, Cl. 272-67.000.
Tanizaki, Yoshiharu: *See—*
Saito, Mashiro; Tanizaki, Yoshiharu; Furuta, Keiichi; and Minagawa, Kenichiro, 3,746,645.
Tanner, Ernst; and Sides, James R., to Celanese Corporation. Casing and propellant of nitrocellulose filaments and nitrocellulose fibers. 3,745,927, Cl. 102-103.000.
Tappan Company, The: *See—*
Lamb, John T., 3,746,938.
Tarshis, Lemuel A.: *See—*
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Tartarini, Cesare. Machine for vacuum packaging various products, in particular for vacuum packaging food products. 3,745,742, Cl. 53-112.00a.
Tate, Brian Christopher: *See—*
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Tauchman, Edwin J.: *See—*
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Tausch, Walter: *See—*
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Tawada, Hiroyuki; Natsugari, Hideaki; Meguro, Kanji; and Kuwada, Yutaka, to Takeda Chemical Industries, Ltd. Method for the production of benzodiazepine derivatives. 3,746,701, Cl. 260-239.30d.
Tax, Hans: *See—*
Tax, Hans; and Franke, Rodiger (said Rodiger, Franke, assor. to said), 3,746,182.
Tax, Hans; and Franke, Rodiger, said Rodiger, Franke, assor. to said Tax, Hans. Oscillation damping arrangement for the load carrier of a hoist. 3,746,182, Cl. 212-125.000.
Taylor, George William: *See—*
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Taylor Machine Works: *See—*
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Taylor, Nathan Eldred. Internal surface drum memory. 3,747,080, Cl. 340-174.10e.
Taylor, Philip Thomas. Bale carrying and stacking apparatus. 3,746,186, Cl. 214-6.00b.
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Terrell, Ross C., to Airco, Inc. Ether compounds as inhalation anesthetics. 3,746,770, Cl. 424-342.000.
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Testone, Anthony Q., to Testone Electrostatics Corporation. Static eliminator. 3,746,924, Cl. 317-2.00f.
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Thaler, Sherwood S.; and Berkovits, Barouh V., to American Optical Corporation. Constant energy heartbeat stimulating apparatus with pulse width control. 3,746,005, Cl. 128-419.00p.
Thaler, Sherwood S., to American Optical Corporation. Controlled energy output pacer. 3,746,006, Cl. 128-419.00p.

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Thexton Manufacturing Company: *See—*
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Thom, Wenzel W., to Architectural Art Mfg., Inc. Floor joint cover assembly. 3,745,726, Cl. 52-98.000.

Thomas & Betts Corporation: *See—*
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Thomas, Robert M., to GTE Automatic Electric Laboratories Incorporated. Electronic ring trip circuit. 3,746,798, Cl. 179-18.0hb.

Thomassen, Hermanus Hendrikus Josephus, 1/2 to Multescreen N.V. Movement suggesting display. 3,745,678, Cl. 40-106.520.

Thompson, C. Sheldon: *See—*
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Thompson, Darrell R., to Celanese Corporation. Method of delustering acrylic fibers. 3,746,672, Cl. 260-17.00r.

Thompson, Gerhard R., to International Business Machines Corporation. FET dynamic logic circuit and layout. 3,747,064, Cl. 307-205.000.

Thompson, Henry Bryan; and Mautz, Jerry Lee, to Grace, W. R., & Co. Hermetically sealed shipping package and method of preparing same. 3,746,160, Cl. 206-65.00s.

Thompson, Robert C.; and Cohn, Edward S. Hearing tester. 3,745,674, Cl. 35-9.00r.

Thompson, Stanley P.; and Boyert, David L., to Pyrolyzer Incorporated. Incinerator. 3,745,942, Cl. 110-8.00r.

Thomsen, Jack W. Filter assembly. 3,746,171, Cl. 210-234.000.

Thomson Industries Inc.: *See—*
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Tick, Sanford J.; Zweig, Gunter; and Emeny, William L., Jr., to New Brunswick Scientific Co., Inc. Device for sensing and controlling optical density. 3,746,864, Cl. 250-218.000.

Tidwell, Hubert. Motorcycle. 3,746,113, Cl. 180-32.000.

Tiefenbacher, Eberhard, to Daimler-Benz Aktiengesellschaft. Heat-exchanger. 3,746,083, Cl. 165-83.000.

Timex Corporation: *See—*
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Timrot, Dmitry Lvovich; and Makhrov, Viktor Vladimirovich. Method and apparatus for measuring characteristics of electric circuits. 3,746,980, Cl. 324-65.00r.

Tiss, Irving D. Garment hanger sheet material. 3,746,222, Cl. 223-87.000.

Titchenal, Oliver R.; and Armstrong, William A., to Dow Chemical Company, The. Collapsible filling spout. 3,746,056, Cl. 141-114.000.

Titchenal, Oliver R., to Dow Chemical Company, The. Collapsible filling spout for bag filling machine. 3,746,057, Cl. 141-114.000.

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Tomita, Chikayoshi: *See—*
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Torok, Vilmos; and Skoog, Hans O., to Allmanna Svenska Elektriska Aktiebolaget. Current converter control system. 3,746,966, Cl. 321-5.000.

Torre, Alton John, to RCA Corporation. Cathode-ray tube including a glass envelope with two spaced external conductive coating and a connecting strip of a third external conductive. 3,746,904, Cl. 313-64.000.

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Treybig, James Alva; and Greene, Eugene Franklin, Jr., said Treybig assor. to Texaco Inc. High resolution reflection shooting with data mixing. 3,747,056, Cl. 340-15.5mc.

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Trimble, Jerry R.: *See—*
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Tsang, Chout Wun. Tie-knot unit. 3,745,614, Cl. 24-153.000.

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Tsuji, Nobuo; Miyazako, Takushi; Ueda, Hirozo; and Ono, Yoshiako, to Fuji Photo Film Co., Ltd. Process for producing a photographic light-sensitive element. 3,746,547, Cl. 96-84.00a.

Tsuruishi, Yuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece having alarm means. 3,745,761, Cl. 58-38.000.

Tucker, Alfred J., Jr., to Chicago Rawhide Manufacturing Company. Radial shaft seal with positively retained garter spring. 3,746,351, Cl. 277-152.000.

Tuffias, Robert H.: *See—*
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Tullman, Gerald M., to Monsanto Company. Ammoxidation of saturated hydrocarbons. 3,746,737, Cl. 260-465.300.

Turner, Edgar P. Shuttle boxing and protection stopping means for fly shuttle looms. 3,746,054, Cl. 139-341.000.

Turner, Roger Scott. Sectioners. 3,745,716, Cl. 51-96.000.

Tuxco Corporation: *See—*
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Tweit, Robert C., to Searle, G. D., & Co. 2-Benzylamino-5-(5-bromo-2-methoxyphenyl)-1, 3,4-thiadiazole and congeners. 3,746,716, Cl. 260-300.80d.

Uberbachek, Edward C.: *See—*
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Uchiyama, Yasuji: *See—*
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Uchiyama, Yasuji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyer circuit for electronic musical instrument. 3,746,775, Cl. 84-1.260.

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Ujiie, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Process and apparatus for triple-electrode MIG welding using short-circuit and spray-arc deposition. 3,746,833, Cl. 219-137.000.
Ulbing, Cynthia G.: *See—*
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National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Bunce, Robert C. Automatic carrier acquisition system. 3,746,998, Cl. 325-420.000.
Jakstys, Vito Joseph. Composite antenna feed. 3,747,111, Cl. 343-725.000.
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Urban, Norbert; and Richters, Hans, to Volkswagenwerk Aktiengesellschaft. Closing device for gas and liquid containers. 3,746,209, Cl. 220-40.00r.
Urbanic, John E., to Calgon Corporation. Colored activated carbon. 3,746,655, Cl. 252-430.000.
Urbutis, Aligmantas Povilas, to Union Carbide Corporation. Method and apparatus for shirring delicate and fragile food casings. 3,745,610, Cl. 17-42.000.
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Van Benthuysen, John D.; Budd, Wilbert N.; and Cormican, Robert E., to CTS Corporation. Tandem electrical control. 3,747,043, Cl. 338-134.000.
Van Best, Jasper Anton; Avenarius, Ernst Frederik; and De Zeeuw, Jan Willem, to U.S. Philips Corporation. Apparatus for detecting arcs. 3,746,930, Cl. 317-31.000.
Van Camp, Robert L.; and Phillips, Bernard C., to Borg-Warner Corporation. Fuel feed and charge forming method and apparatus. 3,746,320, Cl. 261-35.000.
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Van Hart, Richard E., to Armstrong Cork Company. Method and apparatus for producing adhesive-backed tile. 3,746,596, Cl. 156-251.000.
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Vance, Gary R., to NL Industries, Inc. Water soluble flux composition. 3,746,620, Cl. 148-23.000.
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Vargo, William J. Rubberized metal reinforced belt grommet installing machine. 3,745,634, Cl. 29-200.00p.
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Vaughn, George A.; and Hargrave, Richard D., to Maark Corporation. Platform tennis court. 3,745,729, Cl. 52-222.000.
Vauhkonen, Esko. Twin wire paper making machine wherein the wires travel in an arc. 3,746,613, Cl. 162-301.000.
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Dallach, Gerd; Dudszus, Alfred; Fretwurst, Lothar; Granz, Jochen; and Schlottmann, Dietrich, 3,746,466.
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Veltze, Stanislaw Marian; and English, Paul Everitt, to British Iron and Steel Research Association, The. Device for measuring temperature of molten metal. 3,745,834, Cl. 73-343.00r.
Vencil, Naylan N., to Dresser Industries, Inc. Apparatus for producing multiple zone oil and gas wells. 3,746,089, Cl. 166-106.000.
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Vennola, Jorma, to Columbia Broadcasting Systems, Inc. Toy beads and assembly. 3,745,694, Cl. 46-16.000.
Verdier, Henri, to Compagnie Generale des Etablissments Michelin, raison sociale Michelin & Cie. Monobloc wheel. 3,746,399, Cl. 301-65.000.
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Vereschagin, Leonid Fedorovich; Bakul, Valentin Kikolaevich; Semerchan, Aik Akopovich; Prikhna, Alexei Iosifovich; Popov, Vladimir Vasilievich; Ryabinin, Jury Nikolaevich; Livshits, Leopold Davydovich; Arkhipov, Robert Georgievich; Dslesarev, Vladislav, Niolaevich; Galaktionov, Vasily Andreevich; and Semyashkevich, Boris Pavlovich. Apparatus for developing high pressure and high temperature. 3,746,484, Cl. 425-77.000.
Vernot, Ralph T.; and Neill, Jimmie, to OCR Systems, Inc. Optical scanner and signal processing system. 3,747,066, Cl. 340-146.3ag.
Vesper, Richard M.: *See—*
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Vezina, Claude; Saucier, Rene; and Sehgal, Surendra N., to American Home Products Corporation. Process for the preparation of antimycin A. 3,746,623, Cl. 195-80.000.
Vian-Ortuno, Angel; and Martin-Municio, Vicente, to Empresa Auxiliar de la Industria S.A. Apparatus for interacting particulate material with gas. 3,745,668, Cl. 34-57.00a.
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Vilotti, Donald Richard. Portable magnetic rack for guns, fishing rods and the like. 3,746,177, Cl. 211-64.000.
Viner, George Charles, to Westinghouse Brake and Signal Company Limited. Fluid-pressure actuators. 3,746,134, Cl. 188-203.000.
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Walding, Eugene C., to Oak Electro/Netics Corporation. Band pass filter with transmission line section. 3,747,030, Cl. 333-73.000.
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Walker, Gerald E., to Automation Industries, Inc. Stroboscope control system. 3,746,890, Cl. 307-293.000.
Wall, Arvel L., to Doughboy Industries, Inc. Multi-piece vertical support for swimming pools. 3,745,593, Cl. 4-172.190.
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Wallgren, Harald Anton Ake, to Aktiebolaget Electrolux. Pneumatic liquid disposal system. 3,746,032, Cl. 137-205.000.
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Warszawski, Bernard, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Fuel cell battery. 3,746,578, Cl. 136-86.00r.
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Watanabe, Kouichi, to Kurita Water Industries Ltd. Simple water treating apparatus. 3,746,174, Cl. 210-282.000.
Watkins, Phillip L.; Cox, Raymond W.; Carl, John M.; and Judd, John F., to United States of America, Navy. Receptacle for large scale integrated circuit (L.S.I.) package. 3,747,046, Cl. 339-17.0cf.
Watson, James Power, to RCA Corporation. Magnetic drum head mount. 3,747,081, Cl. 340-174.10c.
Watson, Raymond Slaysman, to Ward Machinery Company, The. Oscillating knife-rotating anvil flying cutter. 3,745,864, Cl. 83-295.000.
Wattenburg, Willard Harvey; and Glass, John P. Record card comparing and print enabling mechanism. 3,745,919, Cl. 101-269.000.
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Weihe, Vernon I., to Vega Precision Laboratories, Incorporated. Polar to rectilinear chart system. 3,746,846, Cl. 235-150.270.
Weil, Edward D.; Fearing, Ralph B.; and Eisenberg, Bernard J., to Stauffer Chemical Company. Process for flame retarding fabrics. 3,746,572, Cl. 117-136.000.
Weil, Sanford A.: *See*—
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Welding Research, Inc.: *See*—
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Welker, Robert H., to Texsteam Corporation. Flow regulator. 3,746,300, Cl. 251-63.500.
Weller, John J.: *See*—
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Welton, Russell L., to Globe Oil Tools Company. Well drilling bit lubrication and seal. 3,746,405, Cl. 308-8.200.
Welzel, Josef; Bull, Hans; and Maykemper, Alfred, to Hemsheidt, Hermann, Maschinenfabrik. Hydraulic roof-support frame. 3,745,772, Cl. 61-45.00c.
Wentorf, Robert H., Jr.; and Rocco, William A., to General Electric Company. Diamond tools for machining. 3,745,623, Cl. 25-95.00b.
Wentworth, Fitzwilliam Allan, to Cutler-Hammer, Inc. Magnetic firing circuits. 3,746,888, Cl. 307-282.000.
Werner, Joseph J.; and Amdur, Elias J., to Honeywell Inc. Dry torque motor servo valve. 3,746,046, Cl. 137-625.610.
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Wesner, Charles R., to Sperry Rand Corporation. Digital compass repeater readout device. 3,746,843, Cl. 235-92.0ea.
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Williams, Patrick Robert, to Temtool Pty. Limited. Guillotine sharpener. 3,745,721, Cl. 51-249.000.
Williams, Richard Jean, to RCA Corporation. Anti-condensation device for infra-red detector. 3,746,873, Cl. 250-83.30h.
Williams, Robert H. Rotary combustion engine. 3,745,979, Cl. 123-8.150.

Williams, Thomas A., to Scott Machine Development Corporation. Packaging method and apparatus. 3,745,740, Cl. 53-26.000.
Willinger, Allan H.; Dinnerstein, Albert J.; and Kagan, Avihu, to Metaframe Corporation. Aquarium filtration indicator. 3,746,168, Cl. 210-87.000.
Willinger, Allan H.; and Dinnerstein, Albert J., to Metaframe Corporation. Aquarium filtration device. 3,746,169, Cl. 210-87.000.
Willinger, Allan H., to Metaframe Corporation. Wall-mount air pump. 3,746,478, Cl. 417-413.000.
Wilson, Joseph G. Garden seeder. 3,745,945, Cl. 111-96.000.
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Wunsch, Alfred, to Aktiengesellschaft Brown, Boveri & Cie. Procedure for improving the sealing of an aerodynamic pressure wave machine and a device to effect the procedure. 3,746,128, Cl. 184-6.110.
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Yamazaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Load lifting jacks. 3,746,307, Cl. 254-126.000.
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Young, William G.; and Horning, Frederick G., to Salem Tool Company, The. Auger section positioning hoist having pendent control means. 3,746,110, Cl. 175-85.000.
Younger, George F., to Kingmann-White, Inc. Differential pressure flow meters. 3,745,826, Cl. 73-211.000.
Yu, Ying-Nien: *See—*
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Yu, Ying-Nien; and Pennington, William, to Yu, Ying-Nien. Electric bulb heated water bed system. 3,746,835, Cl. 219-217.000.
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Zaretsky, Leo G., to Control Data Corporation. Reference power supply having an output voltage less than its control element. 3,747,008, Cl. 330-110.000.
Zarfoss, James R.; Snader, Earle S.; and Hale, Elden A., Sr., to Koppers Company, Inc. Closure for exhaust stack. 3,745,907, Cl. 98-59.000.
Zaugg, Roland, to Schild, A., S.A. Fine-adjustment device for watch-movement regulator-assembly. 3,745,763, Cl. 58-109.000.
Zechnall, Richard; Schmidt, Peter; and Wahl, Josef, to Bosch, Robert, G.m.b.H. Apparatus to control the proportion of air and fuel in the air-fuel mixture of internal combustion engines. 3,745,768, Cl. 60-276.000.
Zehnder, Hans: *See—*
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Zeldman, Maurice I.; Lindemann, Glen W.; and Mahidhara, Murali, to North American Rockwell Corporation. Power toothed transmission device. 3,745,851, Cl. 74-434.000.
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Zentmyer, John H. Retaining ring. 3,745,800, Cl. 70-458.000.
Zey, Aubrey F.; Przygocki, Julius V.; and Van Huffel, Phillip, to American Standard, Inc. Sulfur dioxide collection system. 3,745,751, Cl. 55-122.000.
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Zielinski, Richard J.; and Gilmore, Cecilia, to SCM Corporation. Edible whippable topping compositions containing a polyoxyalkylene derivative of a polyglycerol higher fatty acid ester. 3,746,552, Cl. 99-139.000.
Zika, Harry T., to Union Carbide Corporation. Surfactant composition. 3,746,096, Cl. 166-311.000.
Zima, Herbert; and Forstner, Josef, to Vianova-Kunstharz A.G. Aqueous polymer dispersion, method of producing same, and their use as binders in paper coatings. 3,746,671, Cl. 260-8.000.
Zmailik, Josef: *See*—
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Zola, Charles L.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM
PATENTS WERE ISSUED ON THE 17TH DAY OF JULY, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allan, Adrian R., Jr., and M. P. Fink, to Flanders Filters, Inc. Filter frame seal. Re. 27,701, 7–17–73, Cl. 55—500.

Barrett, Wayne T., M. G. Sanchez, and M. C. Vanik, to W. R. Grace & Co. Sols of Actinide metal oxides. Re. 27,697, 7–17–73, Cl. 252—301.1.

Bendix Corp., The: *See*—
Weaver, Richard S., Miller, and Slavin. Re. 27,699.

Fink, Martin P.: *See*—
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Flanders Filters, Inc.: *See*—
Allan, Adrian R., Jr. Re. 27,701.

Grace, W. R., & Co.: *See*—
Barrett, Wayne T. Sanchez, and Vanik. Re. 27,697.

Hawes, Edward M. Soil penetration and shear measuring instrument. Re. 27,696, 7–17–73, Cl. 73—84.

Kabushiki Kaisha Ricoh: *See*—
Suzuki, Shigeru, Sugita, Koizumi, and Kanno. Re. 27,700.

Kanno, Tadaaki: *See*—
Suzuki, Shigeru, Sugita, Koizumi, and Kanno. Re. 27,700.

Koizumi, Yutaka: *See*—
Suzuki, Shigeru, Sugita, Koizumi, and Kanno. Re. 27,700.

Miller, John M.: *See*—
Weaver, Richard S., Miller, and Slavin. Re. 27,699.

Petranek, David J., to The Trane Co. Dual powered refrigeration system. Re. 27,702, 7–17–73, Cl. 62—236.

RCA Corp.: *See*—
Werst, Joseph L. Re. 27,698.

Sanchez, Moises G.: *See*—
Barrett, Wayne T., Sanchez, and Vanik. Re. 27,697.

Slavin, Michael: *See*—
Weaver, Richard S., Miller, and Slavin. Re. 27,699.

Sugita, Keiji: *See*—
Suzuki, Shigeru, Sugita, Koizumi, and Kanno. Re. 27,700.

Suzuki, Shigeru, K. Sugita, Y. Koizumi, and T. Kanno, to Kabushiki Kaisha Ricoh. Electrophotographic duplicator. Re. 27,700, 7–17–73, Cl. 355—13.

Trane Co., The: *See*—
Petranek, David P. Re. 27,702.

Vanik, Milton C.: *See*—
Barrett, Wayne T., Sanchez, and Vanik. Re. 27,697.

Weaver, Richard S., J. M. Miller, and M. Slavin, to The Bendix Corp. Control system for automobile air conditioners. Re. 27,699, 7–17–73, Cl. 165—23.

Werst, Joseph L., to RCA Corp. Ganged ring magnets for coordinated control of a plurality of beams. Re. 27,698, 7–17–73, Cl. 335—212.

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AMP Inc.: *See*—
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Abbo, Toma O. Game board object. 227,790, 7–17–73, Cl. D34—5.

Acme General Corp.: *See*—
Giandomenico, Nicholas. 227,734.
Giandomenico, Nicholas. 227,735.

Adamson, Gerald, J., J. W. Kuypers, and I. P. Norton, to Donn Mills Development Ltd. Telephone kiosk, 227,755, 7–17–73, Cl. D13—1.

American Home Products Corp.: *See*—
Cleeland, Raymond T. 227,728.

American Playground Device Co.: *See*—
Henning, Steven A., and Miller. 227,792.

Amerock Corp.: *See*—
Tegner, Raymond U. H. 227,739.

Anderson, David B., Jr., Candle holder. 227,798, 7–17–73, Cl. D48—2.

Arbon, Dennis C., to Walker Crosweller & Co. Ltd. Faucet. 227,760, 7–17–73, Cl. D23—23.

Arbon, Dennis C. to Walker Crosweller & Co. Ltd. Faucet. 227,761, 7–17–73, Cl. D23—23.

Arbon, Dennis C., to Walker Crosweller & Co. Ltd. Faucet. 227,762, 7–17–73, Cl. D23—23.

Ashford, Samuel B.: *See*—
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Baer, Henry B., to Imperial Knife Associated Co., Inc. Combination whetter and sheath. 227,733, 7–17–73, Cl. D8—91.

Ball, Charles W., and A. Brodsky. Windshield cleaner. 227,731, 7–17–73, Cl. D7—5.

Barkley, William. Scuba diver's board. 227,808. 7–17–73, Cl. D71—1.

Beder, Michael, to Wallmounts, Inc. Sewing caddy. 227,727, 7–17–73, Cl. D6—186.

Bell Telephone Laboratories, Inc.: *See*—
Hazell, Norman C., McGarvey, Prescott, and Stokes. 227,782.

Borste, Jordan W., & Penselfabrik, A/S: *See*—
Lindbo, Per. 227,719.

Boyce, Elvin L., to Tape Lecator, Inc. Tape applicator. 227,810, 7–17–73, Cl. D74—1.

Brady, Richard V. Casket shipping cover. 227,758, 7–17–73, Cl. D19—1.

Brady, Ronald C. Pendant. 227,797, 7–21–70, Cl. D45—17.

Brodsky, Alexander: *See*—
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Bunk Trunk Distributors: *See*—
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375 3,745,871
433 3,745,874
473 3,745,872

CLASS 86
1 3,745,873
23 3,745,875

CLASS 89
1.7 3,745,876
28 3,745,877
33B 3,745,878
37C 3,745,879
43R 3,745,880
117 3,746,590
163 3,745,881

CLASS 91
1 3,745,882
18C 3,745,883
216B 3,745,885
306 3,745,886
374 3,745,884

CLASS 92
9 3,745,888
146 3,745,887
187 3,745,889
192 3,745,890

CLASS 93
36.1 3,745,891
49M 3,745,892
61A 3,745,893
61 3,745,894

CLASS 95
11R 3,745,895
11.5R 3,745,896
12 3,745,897
13 3,745,898
19 3,745,899
3,745,900
51 3,745,903
53EB 3,745,901
53.3 3,745,902
89R 3,745,904
3,745,905

CLASS 96
1.4 3,746,538
36.4 3,746,540
38.4 3,746,541
48R 3,746,542
61R 3,746,543
66.3 3,746,545
66.4 3,746,544
68 3,746,539
84A 3,746,547
113 3,746,548
126 3,746,549

CLASS 98
59 3,745,907
115LH 3,745,908

CLASS 99
51 3,746,550
81 3,746,546
122R 3,746,551
139 3,746,552
140R 3,746,553
141A 3,746,554
323.9 3,745,909
419 3,745,910
426 3,745,911
446 3,745,912
625 3,745,913
630 3,745,914

CLASS 100
38 3,745,915
215 3,745,916

CLASS 101
93C 3,745,917
111 3,745,918
269 3,745,919
329 3,745,920
378 3,745,921

CLASS 102
16 3,745,922
41 3,745,923
43P 3,745,924
70.2R 3,745,925
93 3,745,926
103 3,745,927
105 3,745,928

CLASS 104
8 3,745,929
17A 3,745,931
17R 3,745,930
172B 3,745,932

CLASS 105
61 3,745,933
376 3,745,934

CLASS 106
35 3,746,555
47R 3,746,556
65 3,746,557
213 3,746,558
288B 3,746,559
307 3,746,560

CLASS 108
1 3,745,935
48 3,745,936
128 3,745,937

CLASS 109
49.5 3,745,938

CLASS 110
8A 3,745,939
8R 3,745,940
3,745,941
3,745,942
182.5 3,745,943

CLASS 111
7 3,745,944
96 3,745,945

CLASS 112
65 3,745,946
121.11 3,745,947
123 3,745,948
152 3,745,949
169 3,745,950
221 3,745,951
258 3,745,952

CLASS 113
1D 3,745,953

CLASS 114
.5R 3,745,955
.5 3,745,954
23 3,745,956
66.5H 3,745,959
74R 3,745,960
202 3,745,957
236 3,745,958

CLASS 115
6.1 3,745,961
3,745,962
34R 3,745,963
3,745,964

CLASS 116
112 3,745,965
117R 3,745,967
124 3,745,966
129R 3,745,968

CLASS 117
6 3,746,561
36.2 3,746,562
3,746,563
68 3,746,564
72 3,746,566
93.31 3,746,567
94 3,746,565
95 3,746,568
97 3,746,569
102A 3,746,570
105.4 3,746,571
136 3,746,572
139.5CF 3,746,573
201 3,746,574
218 3,746,575

CLASS 118
48 3,745,969
50 3,745,970
3,745,971
261 3,745,972
400 3,745,973

CLASS 119
1 3,745,974
3,745,975
73 3,745,977
129 3,745,976

CLASS 122
483 3,745,978

CLASS 123
8.15 3,745,979
41.74 3,745,980
58AB 3,745,981
102 3,745,982
119R 3,745,983
136 3,745,984
146.5D 3,745,985

CLASS 124
17 3,745,986

CLASS 126
38 3,745,987
273R 3,745,988

CLASS 127
45 3,746,576

CLASS 128
2R 3,745,989
3,745,991
2S 3,745,990
17 3,745,992
23 3,745,993
66 3,745,994
82.1 3,745,995
84B 3,745,996
88 3,745,997
89R 3,745,998
194 3,746,000
214D 3,746,001
277 3,745,999
322 3,746,002
349B 3,746,003
410 3,746,004
419P 3,746,005
3,746,006
455 3,746,007
498 3,746,008
529 3,746,009

CLASS 131
17R 3,746,010
24 3,746,124
70 3,746,011
140P 3,746,012
247 3,746,013
269 3,746,014

CLASS 132
9 3,746,015
46R 3,746,016
92A 3,746,017

CLASS 133
4A 3,746,018

CLASS 134
4 3,746,577
22R 3,746,023
56D 3,746,019
79 3,746,020
122 3,746,021
141 3,746,022

CLASS 135
20 3,746,024
22 3,746,025

CLASS 136
86A 3,746,580
86R 3,746,578
134R 3,746,579

CLASS 137
1 3,746,026
3,746,027
38 3,746,028
81 3,746,029
110 3,746,030
119 3,746,031
205 3,746,032
3,746,033
364 3,746,034
416 3,746,035
487.5 3,746,037
496 3,746,036
513.5 3,746,038
561R 3,746,039
596 3,746,040
599 3,746,041
601 3,746,042
614.04 3,746,043
624.14 3,746,044
625.24 3,746,045
625.61 3,746,046
625.66 3,746,047
628 3,746,048
802 3,746,049

CLASS 138
150 3,746,050

CLASS 139
11 3,746,051
25 3,746,052
192 3,746,053
341 3,746,054

CLASS 140
93.2 3,746,055

CLASS 141
114 3,746,056
3,746,057
129 3,746,058
295 3,746,059
387 3,746,060

CLASS 144
28.5 3,746,061
176 3,746,062
208B 3,746,063
309AC 3,746,064
309R 3,746,065

CLASS 148
11.5F 3,746,581
13 3,746,582
3,746,583
13.1 3,746,584
23 3,746,620
32.5 3,746,585
37 3,746,586
175 3,746,587

CLASS 149
89 3,746,588

CLASS 150
33 3,746,066

CLASS 151
14.5 3,746,068
69 3,746,067

CLASS 156
73 3,746,589
191 3,746,591
202 3,746,592
207 3,746,593
216 3,746,594
245 3,746,595
251 3,746,596
396 3,746,597
400 3,746,598
505 3,746,599

CLASS 157
1.26 3,746,069

CLASS 161
14 3,746,600
24 3,746,601
37 3,745,602
40 3,746,603
69 3,746,604
109 3,746,607
116 3,746,608
122 3,746,605
165 3,746,609
168 3,746,610
206 3,746,611
251 3,746,606

CLASS 162
17 3,746,612
301 3,746,613

CLASS 164
57 3,746,070
87 3,746,071
3,746,072
116 3,746,073
250 3,746,074
252 3,746,075
270 3,746,076
281 3,746,077
363 3,746,078

CLASS 165
1 3,746,079
20 3,746,080
23 Re.27,699
32 3,746,081
61 3,746,082
83 3,746,083
163 3,746,084
172 3,746,085
181 3,746,086
185 3,746,087

CLASS 166
59 3,746,088
106 3,746,089
107 3,746,091
134 3,746,090
207 3,746,092
217 3,746,093
275 3,746,094
295 3,746,095
311 3,746,096
315 3,746,097

CLASS 169
37 3,746,098

CLASS 171
63 3,746,099

CLASS 172
40 3,746,100
112 3,746,101

CLASS 173
4 3,746,102
24 3,746,103
43 3,746,104
44 3,746,105

CLASS 174
45R 3,746,776
94R 3,746,777

CLASS 175
45 3,746,106
61 3,746,108
66 3,746,109
85 3,746,110
207 3,746,107

CLASS 176
19LD 3,746,614
36R 3,746,615
67 3,746,616
78 3,746,617
3,746,618
3,746,619

CLASS 177
163 3,746,111

CLASS 178
5.2R 3,746,778
5.4ST 3,746,779
6.6TC 3,746,781
6.6A 3,746,780
6.8 3,746,782
3,746,783
3,746,784
7.3S 3,746,786
7.5D 3,746,785
22 3,746,799
66A 3,746,787
69.5R 3,746,800

CLASS 179
1GQ 3,746,788
3,746,792
1HF 3,746,790
1SA 3,746,791
1VC 3,746,789
2DP 3,746,793
3,746,794
16F 3,746,795
18AF 3,746,796
18HB 3,746,798
18D 3,746,797
100.2T 3,746,801

CLASS 180
6.2 3,746,112
21 3,746,117
25R 3,746,118
32 3,746,113
42 3,746,119
66R 3,746,115
121 3,746,116

CLASS 181
.5AP 3,746,121
.5EM 3,746,123
.5NC 3,746,120
.5R 3,746,122
31B 3,746,125
36B 3,746,126
50 3,746,114
72 3,746,127

CLASS 184
6.11 3,746,128
6.26 3,746,129

CLASS 186
1B 3,746,130

CLASS 187
29R 3,746,131

CLASS 188
112 3,746,132
196BA 3,746,133
203 3,746,134

CLASS 192
4A 3,746,135
45 3,746,136
48.5 3,746,137
87.11 3,746,138
107R 3,746,139

CLASS 193
5 3,746,140

CLASS 195
63 3,746,621
66R 3,746,622
80 3,746,623
100 3,746,624
103.5R 3,746,625

CLASS 197
16 3,746,141
133R 3,746,142

CLASS 198
88 3,746,143
91 3,746,144
140 3,746,145
219 3,746,146
3,746,147
3,746,148
220CC 3,746,149
233 3,746,150

CLASS 200
5E 3,746,802
6R 3,746,803
14 3,746,804
19R 3,746,805
37R 3,746,806
61.27 3,746,807
67G 3,746,359
3,746,809
67H 3,746,808
81R 3,746,810
144B 3,746,811
153L 3,746,812
157 3,746,813
3,746,814
3,746,815
159A 3,746,816
168H 3,746,818
168K 3,746,817
170A 3,746,819
3,746,820
175 3,746,821

CLASS 202
263 3,746,626

CLASS 204
15 3,746,627
39 3,746,628
148 3,746,629
206 3,746,630
219 3,746,631
224 3,746,632
231 3,746,633

CLASS 206
7F 3,746,152
7K 3,746,151
15.1E 3,746,162
42 3,746,154
43 3,746,155
45.14 3,746,156
46ED 3,746,157
46 3,746,153
47R 3,746,158
56R 3,746,159
65S 3,746,160
72 3,746,161

CLASS 208
18 3,746,634
36 3,746,635
191 3,746,637
216 3,746,636

CLASS 209
44 3,746,164
73 3,746,163
74 3,746,165
3,746,166

CLASS 210
7 3,746,638
18 3,746,639
23 3,746,640
58 3,746,641
70 3,746,167
87 3,746,168
3,746,169
198 3,746,170
234 3,746,171
253 3,746,172
258 3,746,173
282 3,746,174
321 3,746,175
446 3,746,642
506 3,746,195

CLASS 211
13 3,746,176
64 3,746,177
74 3,746,178
75 3,746,179
113 3,746,180
184 3,746,181

CLASS 212
125 3,746,182

CLASS 214
1BB 3,746,184
1BH 3,746,185
1BV 3,746,183
6B 3,746,186
6H 3,746,187
16.1CC 3,746,188
3,746,191
16.4B 3,746,189
34 3,746,190
83.3 3,746,192
92 3,746,193
450 3,746,194

CLASS 215
1A 3,746,197
1C 3,746,196
10 3,746,200
11R 3,746,198
38A 3,746,201
40 3,746,199
42 3,746,202

CLASS 219
10.55 3,746,822
3,746,823
3,746,824
10.77 3,746,825
69E 3,746,827
69S 3,746,826
86 3,746,828
110 3,746,829
121EM 3,746,831
121P 3,746,830
130 3,746,832
137 3,746,833
216 3,746,834
217 3,746,835
328 3,746,836
387 3,746,837
512 3,746,838

CLASS 220
6 3,746,203
9R 3,746,204
13 3,746,205
31R 3,746,206
36 3,746,207
40R 3,746,209
46R 3,746,208
70 3,746,210

CLASS 221
7 3,746,211
253 3,746,212
303 3,746,213

CLASS 222
3 3,746,214
92 3,746,215
137 3,746,216
194 3,746,217
394 3,746,218

CLASS 223
35 3,746,219
42 3,746,220
66 3,746,221
87 3,746,222
91 3,746,223

CLASS 224
42.1C 3,746,224

CLASS 225
19 3,746,225

CLASS 226
25 3,746,226
36 3,746,227
75 3,746,228
91 3,746,229
168 3,746,230
177 3,746,231
187 3,746,232
194 3,746,233
196 3,746,234

CLASS 227
10 3,746,235
88 3,746,236
147 3,746,237

CLASS 228
9 3,746,238
19 3,746,239

CLASS 229
14B 3,746,240
15 3,746,241
23R 3,746,242
37R 3,746,243
3,746,244
40R 3,746,245
62.5 3,746,246

CLASS 230
453R 3,746,735

CLASS 233
1B 3,746,247

CLASS 235
51 3,746,248
54F 3,746,249
61A 3,746,250
61.11E 3,746,840
61.6R 3,746,839
92CV 3,746,842
92EA 3,746,843
92PK 3,746,841
150.2 3,746,844
150.27 3,746,846
151.11 3,746,845
152 3,746,847
156 3,746,848
3,746,849
184 3,746,850
194 3,746,851

CLASS 238
4 3,746,251
10E 3,746,252

CLASS 239
15 3,746,253
3,746,254
51.5 3,746,255
101 3,746,256
102 3,746,257
212 3,746,258
229 3,746,259
321 3,746,260
333 3,746,261
458 3,746,262
542 3,746,263
668 3,746,264

CLASS 240
10R 3,746,852
41.35D 3,746,853
41.36 3,746,854
81LD 3,746,856

CLASS 241
20 3,746,265
46R 3,746,266
46.11 3,746,267
179 3,746,268
244 3,746,269
251 3,746,270

CLASS 242
56R 3,746,271
58.3 3,746,272
75.51 3,746,273
107.4 3,746,274
118.32 3,746,275
129 3,746,276
182 3,746,277
190 3,746,278
206 3,746,287

CLASS 244
2 3,746,279
3.13 3,746,280
3.14 3,746,288
3.2 3,746,281
31 3,746,282
42CB 3,746,283
83E 3,746,284
98 3,746,285
155A 3,746,286

CLASS 246
36 3,746,857

CLASS 248
14 3,746,289
15 3,746,290
68R 3,746,291
154 3,746,292
177 3,746,293
221 3,746,294
226A 3,746,295
441 3,746,296

CLASS 249
40 3,746,297
197 3,746,298

CLASS 250
208 3,746,863

209 3,746,867
218 3,746,669
3,746,864
219Q 3,746,868
219S 3,746,865
227 3,746,870
270 3,746,871
310 3,746,855
313 3,746,872
325 3,746,858
352 3,746,873
358 3,746,874
372 3,746,866
380 3,746,861
402 3,746,860
409 3,746,862
501 3,746,859

CLASS 251

25 3,746,299
63.5 3,746,300
64 3,746,301
103 3,746,302
145 3,746,308
159 3,746,303
327 3,746,304
360 3,746,305

CLASS 252

33 3,746,643
47.5 3,746,644
51.5A 3,746,645
91 3,746,647
95 3,746,646
170 3,746,649
171 3,746,648
301.1 Re.27,697
3,746,650
301.4F 3,746,651
301.4R 3,746,652
321 3,746,653
400A 3,746,654
430 3,746,655
437 3,746,656
3,746,657
439 3,746,658
448 3,746,659
455R 3,746,660
3,746,661
513 3,746,662

CLASS 254

19 3,746,306
126 3,746,307
150 3,746,309

CLASS 259

1R 3,746,310
3 3,746,312
7 3,746,311
21 3,746,314
3,746,315
57 3,746,316
154 3,746,313
185 3,746,317
191 3,746,318
192 3,746,319

CLASS 260

2A 3,746,678
2.5AD 3,746,666
2.5AG 3,746,663
2.5AM 3,746,664
2.5AN 3,746,665
2.5A 3,746,667
2.5M 3,746,668
3 3,746,669
7.5 3,746,670
8 3,746,671
17R 3,746,672
22CB 3,746,673
23AR 3,746,674
23EM 3,746,675
27R 3,746,677
27 3,746,676
29.2EP 3,746,680
29.6ME 3,746,679
29.6PM 3,746,681
32.6N 3,746,682
33.2R 3,746,683
33.4R 3,746,725
46.5E 3,746,738
47CP 3,746,684
47EC 3,746,685
47EN 3,746,686
50 3,746,687
75T 3,746,688
77.5AS 3,746,690
77.5MA 3,746,692
77.5TB 3,746,689
77.5R 3,746,691
78R 3,746,693
80.78 3,746,694
88.2D 3,746,695
93.1 3,746,696
112.5 3,746,697
137 3,746,698
209R 3,746,699
239BD 3,746,702
239.3D 3,746,701
240A 3,746,705
240F 3,746,704
3,746,706
243AN 3,746,707
247.2A 3,746,708
248NS 3,746,709
249.8 3,746,710
250A 3,746,712
250R 3,746,711
251P 3,746,713
293.58 3,746,715
297.7 3,746,727
299 3,746,700
300.8D 3,746,716
306.7 3,746,717
3,746,718
306.8D 3,746,719
310D 3,746,720
326S 3,746,721
326.5E 3,746,722
327E 3,746,723
329AM 3,746,724
347.8 3,746,726
403 3,746,728
404.5 3,746,729
413 3,746,730
426 3,746,731
429R 3,746,732
439R 3,746,733
448.2B 3,746,734
463 3,746,736
465.3 3,746,737
468E 3,746,739
469 3,746,740
471C 3,746,742
471R 3,746,741
473A 3,746,743
475P 3,746,744
475R 3,746,745
478 3,746,746
485R 3,746,747
486R 3,746,748
497A 3,746,749
514K 3,746,750
515A 3,746,751
515P 3,746,752
519 3,746,753
524R 3,746,754
525 3,746,755
533R 3,746,756
534R 3,746,757
543A 3,746,760
543P 3,746,758
543R 3,746,759
544L 3,746,761
551R 3,746,765
558R 3,746,762
561A 3,746,763
562H 3,746,703
564F 3,746,764

CLASS 261

35 3,746,320
50A 3,746,321
53 3,746,322
122 3,746,323

CLASS 263

2R 3,746,504

CLASS 266

1R 3,746,324
13 3,746,325
23M 3,746,326
25 3,746,327
36P 3,746,328

CLASS 267

125 3,746,329
137 3,746,330
182 3,746,331

CLASS 269

328 3,746,332

CLASS 271

56 3,746,333

CLASS 272

59A 3,746,335
59R 3,746,334
67 3,746,336
81 3,746,337
3,746,338
82 3,746,339

CLASS 273

95H 3,746,340
121A 3,746,341
134D 3,746,344
135D 3,746,342
136B 3,746,343
155 3,746,345

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Frederick B. Dent, *Secretary*